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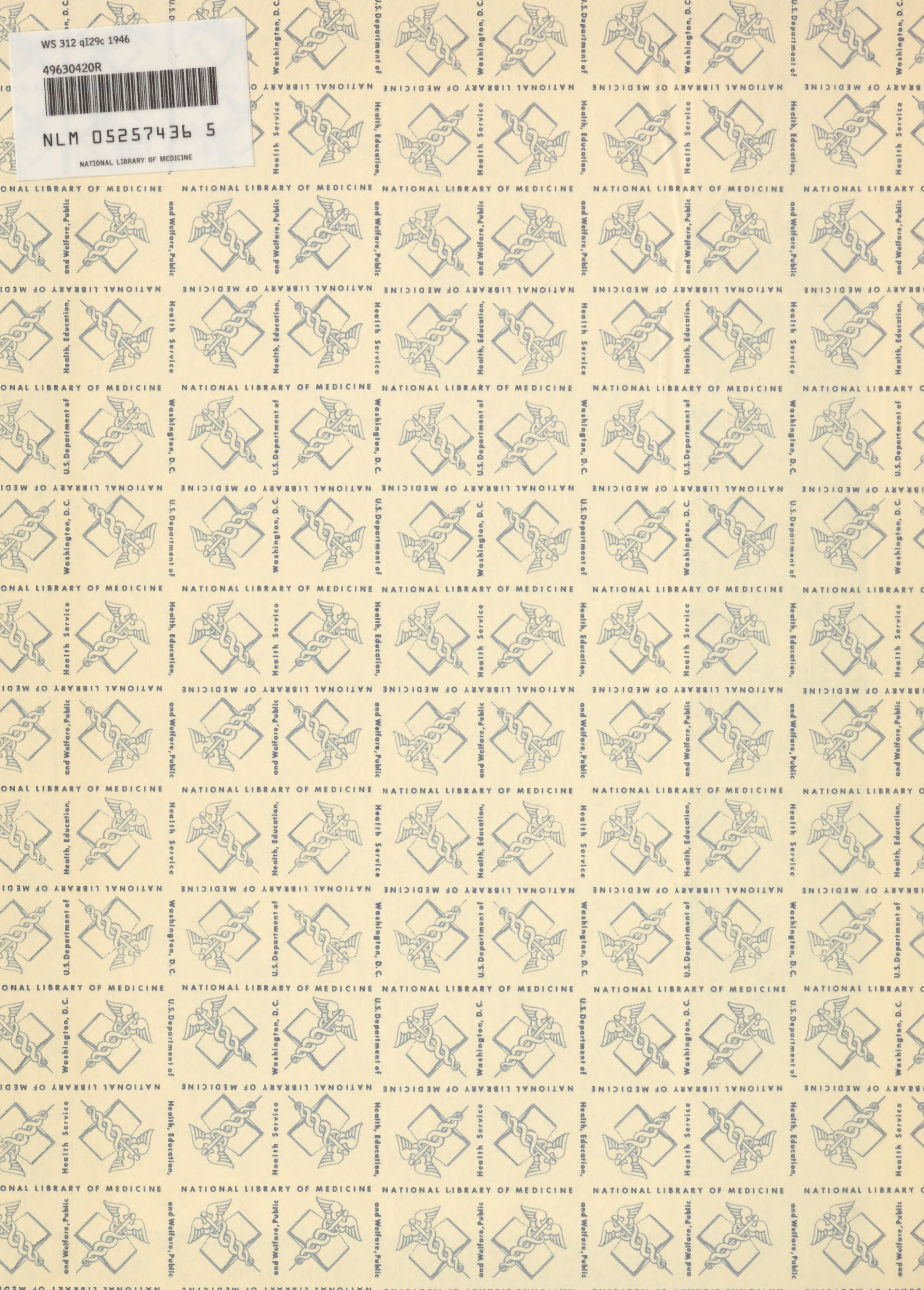
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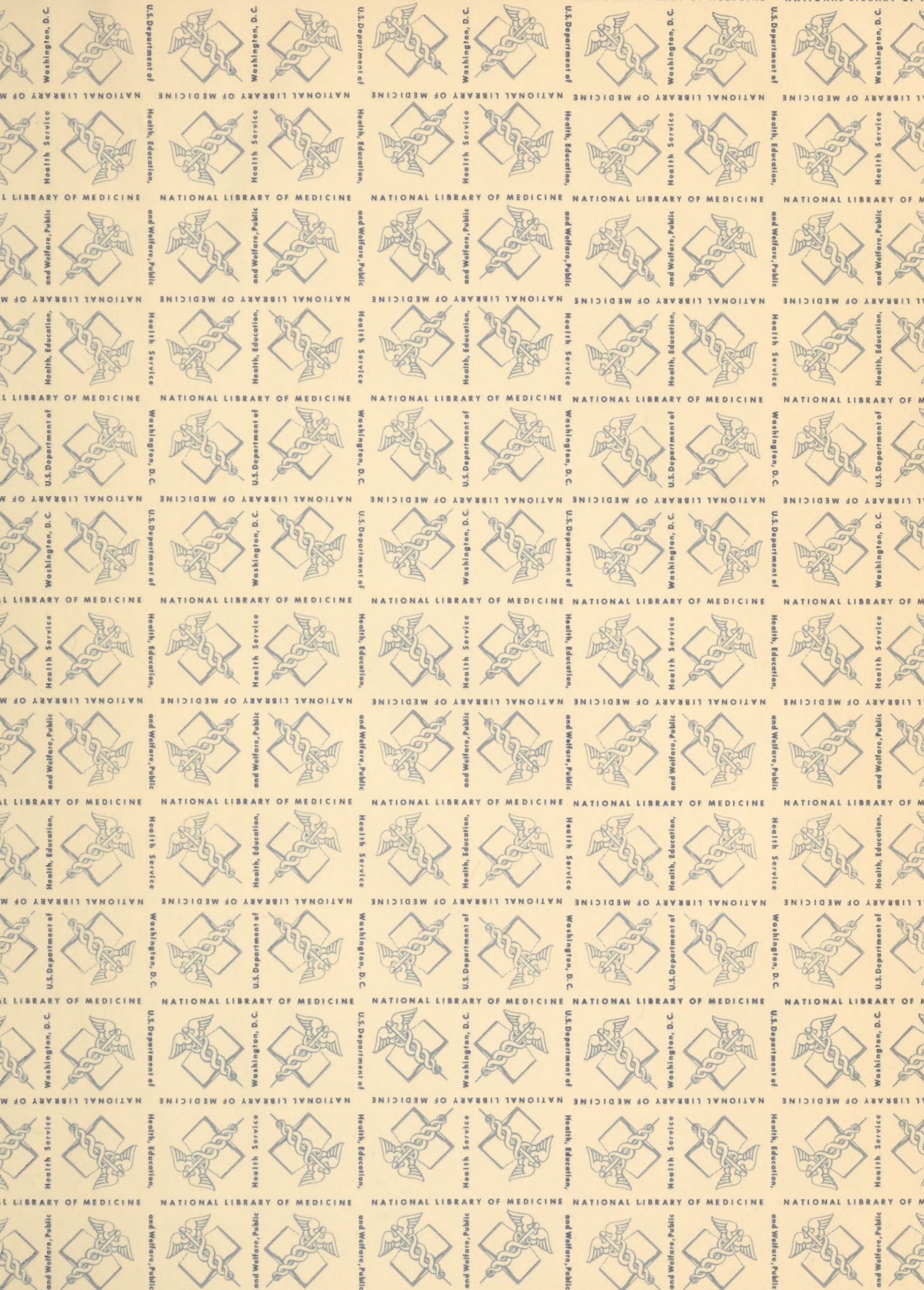
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CONFERENCE ON EPIDEMIC DIARRHEA AMONG NEWBORNS

AUGUST 27 1946

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ILLINOIS DEPARTMENT OF PUBLIC HEALTH

✓ CONFERENCE ON EPIDEMIC DIARRHEA AMONG NEWBORNS, SPRINGFIELD, ILL., 1946

August 27, 1946 - 9:30 A.M.

Benquet Hall - Leland Hotel
Springfield, Illinois

Chairman - Richard F. Boyd, M.D., Chief
Division of Local Health Administration
Illinois Department of Public Health

10:00 A.M. 1. Clinical Picture of Epidemic Diarrhea in the Newborn

Louis W. Sauer, M.D.,
Asst. Professor of Pediatrics
Northwestern University
School of Medicine

10:45 A.M. 2. Epidemiology and Reporting

Jerome J. Sievers, M.D., Chief,
Division of Communicable Diseases
Illinois Department of Public Health

11:15 A.M. 3. Status of Research on Etiology

Surgeon James Watt
U.S. Public Health Service
Division of Infectious Diseases
National Institute of Health
Washington, D.C.

LUNCHEON PERIOD

2:00 P.M. 4. Panel Discussion: The Responsibility of the State Department of Public Health through Maternity Hospitals

Chairman: Henrietta Herbolzheimer, M.D., Chief,
Division of Maternal and Child Hygiene, I.D.P.H.

H. J. Shaughnessy, Ph.D., Chief,
Division of Laboratories, I.D.P.H.

Charles Newberger, M.D.,
Consultant in Maternity, I.D.P.H.

George K. Hendrix, Senior Sanitary Engineer
Hospital Sanitation Specialist, I.D.P.H.

Miss Edna Heyde, R.N.,
Maternity Hospital Nurse Consultant, I.D.P.H.

Sister M. Justina, Superintendent
St Joseph's Hospital
Alton, Illinois

Kenneth Humphrey, M.D., Pediatrician
Alton, Illinois

5. General Discussion

FOREWARD

Herewith are presented the proceedings of a conference on epidemic diarrhea of the newborn which took place in Springfield August 27 1946. It was called by the Department of Public Health as a result of a series of outbreaks in the nurseries of several hospitals in Illinois. Hospital superintendents and medical staff members in charge of nurseries were invited to attend. The purpose of the conference, which was well attended, was to stimulate and arouse as much active interest as possible in the best known methods of preventing and controlling epidemic diarrhea of the newborn.

Among the events leading immediately to the conference were a few sharp outbreaks that lead to the closing of the maternity departments and the nurseries of the hospitals concerned. In some cases this radical action was taken voluntarily by the hospitals. In other cases it was imposed originally by the Department of Public Health. In all cases where the situation required it, the closing was made official by the Department so that reopening would take place only after steps deemed necessary by the Department for the safety of mothers and babies had been taken. The action of the Department was by way of discharging responsibilities imposed upon it by the Maternity Hospital Licensing Law.

The sporadic nature of the outbreaks, the considerable mortality therefrom, the inconvenience to the medical profession and to prospective mothers caused by the closing of maternity wards aroused widespread public interest, as well it might. No less than 37 infants under one month of age died from epidemic diarrhea of the newborn in hospitals in Illinois during the first seven months of 1946. An additional 79 between one and twelve months of age died from the same disease during the same period, 58 in hospitals and 21 in homes.

These statistics emphasize the seriousness of epidemic diarrhea of the newborn which was not limited to Illinois during the period under discussion. Manifestly the disease is a general problem, the solution of which is a challenge to the medical profession, hospital administrators and public health officers.

It is believed that the conference was highly successful in bringing about a cooperative spirit between the several professions concerned in the solution of the problem and in bringing before the group the best information on controlling epidemic diarrhea of the newborn. It is hoped that the proceedings will serve a similar purpose more widely.

CONFERENCE ON EPIDEMIC DIARRHEA AMONG NEWBORNS

AUGUST 27 1946

The meeting was brought to order by Doctor Boyd who then introduced Dr. Roland R. Cross, Director of the Illinois Department of Public Health.

DR CROSS: Doctor Boyd, Ladies and Gentlemen:

Your presence here today is, to say the least, extremely encouraging. In the hands of many of you rest the health and even the lives of newborn infants. Your presence is encouraging because it indicates that you share with us a very vital concern with the problem of epidemic diarrhea which has been responsible for the loss of a significant number of infants in Illinois this year.

It is true that much remains unknown concerning this disease, particularly in regard to its cause and mode of transmission. But this does not excuse us from doing everything possible to control outbreaks of epidemic diarrhea and even more important to prevent its occurrence. The Department with the aid of hospital authorities and local health departments has bent every effort towards the accomplishment of these objectives.

Today's conference is one more effort and its purpose is to bring up-to-date information to you and to profit by the experience which many of you have had. We are happy to welcome you here. We are grateful, too, in having with us Dr. Sauer of Northwestern University and Dr Watt of the U.S. Public Health Service, both of whom have set aside busy schedules and traveled many miles in order to be here. We look forward to their contributions. Sister Justina, Superintendent of the St. Joseph's Hospital in Alton, has also interrupted her work in order that we might have the benefit of her thinking and experience in this afternoon's panel discussion.

I feel certain that today's conference will prove stimulating and helpful to all of us in dealing with the problems of epidemic diarrhea. The State Department of Public Health is proud, indeed, to serve as your host.

Doctor Boyd then introduced Doctor Sauer.

CLINICAL PICTURE OF EPIDEMIC DIARRHEA IN THE NEWBORN

by

L. W. Sauer, M.D.*
Assistant Professor of Pediatrics
Northwestern University Medical School
Chicago

When the Cradle opened in 1923 for the care, until their adoption, of thirty-

*To be published

six homeless newborns, the nursery and diet kitchen technic of a leading Baltimore hospital were expected to meet any emergency. On admission, the infant was placed in an isolated, cubicled crib with "special precautions" technic for two weeks. If well at the end of that time, the infant was transferred to a six crib room in the general nursery. Morbidity and mortality rates remained low for four years. Until 1927, twenty deaths had occurred--a mortality rate of 4.8 per cent. Eighteen of the deaths were due to epidemic diarrhea (enteritis) of the newborn. Seven infants were admitted with the disease or developed symptoms soon after admission. Eleven developed symptoms more than two weeks after arrival at The Cradle. Because epidemic diarrhea was often absent for months at a time, there seemed to be no reason to question the efficacy of the precautionary technic. During 1927, however, a rapidly spreading epidemic of diarrhea of the newborn occurred. Of the one hundred fifty infants admitted that year, eighty-six contracted it; twenty-seven died (about 32 per cent of the infected infants).

TWO TYPICAL CASES

Two newborns (No. 462 and No. 463), from Chicago maternity hospitals, were admitted to The Cradle on the same day. Both infants appeared normal. Both contracted diarrhea after admission. The one died within a few days; the other developed complications, including purulent otitis media and mastoiditis. Because they typify the two forms of enteritis encountered in the epidemic which followed, excerpts from the clinical, nursing, and postmortem notes follow.

Clifton (No. 462) was born January 17, 1927; weight, six pounds six ounces. When admitted on February 3, 1927, he weighed six pounds ten ounces. Entrance examination was negative. Blood, stool, rectal temperature, urine, nose and throat cultures were normal. He progressed well from February 4 to 8; the stools were apparently normal. February 9, his weight reached six pounds fourteen ounces, but the rectal temperature was 100.4° F. He was fretful, had moderate abdominal distention, refused part of each feeding, and vomited. He passed four semi-liquid stools with curds and mucus; the last two contained blood. On February 10, the rectal temperature was 103.4° F and he looked extremely toxic. The abdominal distention and pallor had increased. Respirations became irregular; he expired forty-eight hours after the onset of symptoms.

Anatomic Diagnosis was as follows: Acute hemorrhagic enteritis; acute hyperplasia of mesenteric lymph nodes; acute fibrinopurulent peritonitis.

Sybil (No. 463) was born February 1, 1927, and weighed six pounds ten ounces. She was admitted on February 3, 1927, weighing five pounds fourteen ounces. Entrance examination was negative. Nose and throat cultures, vaginal smears, blood, urine, stool, and rectal temperature were normal. From February 4 to 15 she was apparently well. There was a good gain in weight; the stools were apparently normal. February 16, her weight was six pounds ten ounces; rectal temperature, 100.4° F.; she was fretful, had moderate abdominal distention, refused food, vomited, looked pale and slightly listless. She passed four semi-liquid, brown, foul, musty odored stools. On February 17 and 18 the toxicity increased; there were four stools daily as above; the weight decreased four ounces. By February 19 the weight had dropped to five pounds ten ounces; the rectal temperature reached 102.8° F., the

pulse was 170, the respirations were 44. Bilateral myringotomy was performed by the attending otologist. On February 21 the weight was five pounds four ounces; rectal temperature 103° F.; abdominal distention had increased. She was transferred to a hospital where a bilateral mastoidectomy was performed; soon thereafter the infant expired.

Anatomic Diagnosis was as follows; Bilateral, acute, suppurative otitis media and mastoiditis; acute, generalized fibrinopurulent leptomeningitis and ethmoiditis; septic thrombosis of lateral venous sinuses; hyperemia of intestinal wall; hyperplasia of mesenteric lymph glands; submucous hemorrhages of stomach and colon. Smears and cultures from ear and mastoid wound revealed gram positive streptococci in chains, spinal fluid culture, *B. coli*.

SYMPTOMATOLOGY

(Sequence of symptoms based on The Cradle Epidemic of 1927)

It is most important that the first case of epidemic diarrhea or enteritis of the newborn should be diagnosed early, so that further admissions can be promptly halted and a spread of the disease prevented.

The earliest symptoms in The Cradle epidemic aroused suspicion, but were not of diagnostic value. In many of the infants the first symptoms were stationary weight, food refusal and four or five stools a day. At first the stools often contained mucus and curds, seldom visible blood. After a few days, as a rule, distention of the abdomen and repeated vomiting set in. Certain diagnosis could seldom be made on the basis of these symptoms. Cardinal symptoms soon appeared. In most of the cases infants admitted with frank symptoms of the disease were promptly isolated or immediately sent to a neighboring hospital. The diagnostic symptoms were the ashen color of the skin; a change from the pink to a grayish hue sometimes occurred overnight. Tissue turgor decreased. Listlessness, progressive weight loss, and toxicity clinched the diagnosis. Whenever this chain of symptoms occurred, regardless of sequence, the diagnosis was certain, especially if the stools became watery. Fever was usually slight at first. There would often be minor daily fluctuations. As the disease progressed, especially in fatal cases with respiratory complications such as bronchopneumonia, otitis media, and mastoid involvement, the rectal temperature often rose above 102 or 103° F. As a rule, the higher the fever, the more precipitous the weight loss.

DIFFERENTIAL DIAGNOSIS

During the prodromal period, before toxicity was present, it was, at times, difficult to differentiate epidemic diarrhea from diarrhea due to over-feeding, improper food, low tolerance for carbohydrates, effect of laxatives or a sugar-rich diet of the nursing mother. However, if intestinal symptoms did not improve promptly when the caloric value of the food was drastically reduced, the disease was usually suspected and the infant promptly isolated. Diarrhea due to parenteral infections such as the common cold, tonsillitis or pyelitis were infrequent in the neonatal period. Furthermore, the sequence of symptoms is different; the diarrhea was secondary and usually responded to treatment.

COMPLICATIONS

Exacerbations, complications and sequelae were frequently encountered. Terminal complications were the rule in the twenty-seven fatal cases. In some infants fine rales were heard at the base of one or both lungs. Examination of the ears in eleven infants revealed otitis media. Incision of the drum membrane by otologists failed to improve the general condition. Mastoidectomy was performed in five infants without altering the downward clinical course.

The course of the disease varied. Infants who recovered usually improved very slowly. Seldom before five weeks did the weight return to what it was at the onset of the disease. The weight curve and listlessness served as the best index of the infant's condition. In the fatal cases dehydration and toxicity kept pace with the weight loss - the pallor increased, the eyes and fontanel became more sunken from day to day. The facies became more fixed and mask-like. A day or two before imminent death the half-open eyes were usually covered with a translucent film. In the preagonal period the vomitus often contained minute flakes of darkened blood. In the twenty-seven infants who died, the duration of the disease varied from two to nineteen days. The average duration in the fatal cases were nine days. As a rule, premature and immature infants offered the poorest resistance to the infection. Infants who died early were more likely to show minute ulcers in the intestine, usually the only evidence of enteritis. Those who lived longer seldom showed visible lesions, but had manifest evidence of secondary infections of the ears and lungs.

ETIOLOGY

Doctor Gladys Dick, a founder and benefactor of The Cradle, made an exhaustive study of the 1927 epidemic. In collaboration with Doctors George Dick and J. Lisle Williams¹ the Morgan dysentery bacillus* was isolated from minute intestinal lesions of every fatal case only when the proper culture medium was used. They found intravenous injection of both cultures and of sterile filtrates highly pathogenic for rabbits. The animals developed hemorrhagic enteritis. They concluded that this bacillus was the primary cause of the epidemic.

PREVENTIVE MEASURES

Repeated isolation of the Morgan dysentery bacillus in the fatal cases led to the conclusion that The Cradle epidemic of 1927 was of intestinal origin. It was manifest that the customary procedures such as closing off parts of the nursery, painting and scrubbing of floors and walls, complete change of nurses, et cetera failed to bring the epidemic to an end. Therefore, drastic precautionary measures were instituted to safeguard all food and supplies. Bottles, nipples, feedings and supplies for infants and nurses - such as gowns and masks - were sterilized by autoclaving at fifteen pounds for one hour. The hands of the nurses, contaminated in changing the diapers of an infected infant, might, in spite of washing, contaminate the feedings of another infant in various ways, as in handling nipples while placing them on the bottles. At first a fresh pair of sterile rubber gloves were worn by nurses for each feeding of each infant. Diapers of all infants

¹Frant and Abramson (2) report other pathogens also as the etiologic factor in epidemic diarrhea. In a recent epidemic a virus was isolated.

were left in lysol solution immediately on removal. Nurses who fed infants were not permitted to change diapers. Very soon after these precautionary measures were instituted, symptoms of the disease no longer appeared in other infants, and the epidemic came to an abrupt end.

RESULTS

During the eighteen years that have passed since the Dick individual aseptic technic was put into effect, several minor changes and short-cuts have been introduced without the occurrence of any hand-borne cross-infection³. Numerous infants with epidemic diarrhea have been admitted; six of them were fatal cases, but no other infant contracted the disease. This is the best evidence that the technic is flawless.

Current precautions are as follows:

- (1) A sterile mask and short-sleeved gown are worn by all who enter a nursery.
- (2) Hands and forearms are cleansed as follows:

3-Minute Scrub

Before entering nursery
After handling "infected" infant
After touching infectious material
After using handkerchief

Technic -

Hands and forearms are

Wet under faucet
Lathered and scrubbed with liquid soap and sterile brush
Rinsed under faucet
Dried on clean individual (or paper) towel
Distribute about 2 cc. (30 drops) 70% alcohol on hands
Allowed to evaporate before an infant or supplies are touched

1-Minute Wash

Between well infants
After handling diaper with stool
After touching mask, door, light switch, etc.

Technic -

Same as above (except that no brush is required).

- (3) Each unit consists of twelve cubicked cribs; each cubicle is equipped with individual, sterile supplies.

Obstetrical hospitals of tomorrow will not have a newborn nursery. Mother and infant form the *Physiologic* ~~psychological~~ unit. This will be the keystone to the hospital care of the obstetrical patient and her infant.

CONCLUSIONS

The clinical picture of epidemic diarrhea of the newborn (neonatal enteritis), encountered at The Cradle in 1927, was usually:

- (a) At first - loss in weight, lack of appetite, increase in the number of stools
- (b) Cardinal symptoms - vomiting, abdominal distention, ashen gray color, listlessness, progressive loss in weight, watery stools and toxicity which made the diagnosis certain.

REFERENCES

1. Dick, G.F., Dick, G.W., and Williams, J.L.: The Etiology of An Epidemic of Enteritis Associated with Pastoiditis in Infants, Am. J. Dis. Child. 35:955, 1928.
2. Frant, S., and Abranson, H.: Epidemic Diarrhea of the Newborn in Brennermann's Practice of Pediatrics, Wagerstrom, W.F. Prior Co., Vol. 1. Chapt. 28, Sec. II, page 19, 1941.
3. Aseptic Nursery Technic, The Cradle, Evanston. 3rd edition, 1946

DISCUSSION OF DR SAUER'S PAPER

Dr Sharp: Does The Cradle have separate personnel to feed and to diaper infants?

Dr Sauer: The Cradle continues to use a "commissary squad" and a "sanitary squad". The commissary squad of nurses only feeds the babies and the sanitary squad has as its duties the diapering.

Dr Rose: Did examination of the brain of infants with diarrhea show any significant pathological finding?

Dr Sauer: The postmortem examination revealed practically nothing. In fact many of the first cases that died were strikingly negative in their findings. It wasn't until quite a while afterward that infants who died showed any significant pathological condition. In the early part of the epidemic when it was most severe the infants became toxic so rapidly and passed out so quickly that the postmortem examination showed nothing.

Mr Hendrix: You mentioned that one of the hospitals in Evanston uses germicidal lamps in order to permit the hospital to continue operating with an overcrowded nursery. Can this overcrowded condition obtain with any degree of safety?

Dr Sauer: I do not think that germicidal lamps help in avoiding the spread of infant diarrhea. I think that such lamps are wonderful especially in nurseries which are air-conditioned.

Mr Vonderheit: What is the census of the Cradle?

Dr Sauer: We have 36 cribs. Dr Gladys Dick, in laying down the rules after the epidemic stated that no unit for care of infants should contain more than 12 cribs. We have three 12 crib units and each crib is separated by a partition. Since The Cradle was founded, it has handled over 5,000 infants. At the present time The Cradle is finishing a third floor which will house

30 more babies. As soon as an infant is discharged, all possible equipment in the unit is autoclaved. This type of construction and the procedures that we have in operation seemed very expensive, but a human life is worth a great deal more than the cost of the equipment and the operation. If the general public is informed as to the values received for its expenditures, money will be no obstacle to setting up a good nursery. The Cradle had no trouble in obtaining \$50,000 to furnish the third floor. With regard to air-conditioning, this is very costly, and most institutions do not need to go to that extent. We did have in The Cradle just as good results before the air-conditioning was installed. We have, however, very good nurses. If any nurse breaks a rule two times she is discharged automatically. If a nurse was on duty with diarrhea which she had not reported, she is subject to dismissal.

It should be brought out that anything which touches the infant's lips should be absolutely sterile. Formulas should not be allowed to stand around uncovered and continuous alertness should obtain in order to check for breaks in the feeding technics.

You all appreciate that the infants who come to The Cradle come from hovels or in some instances third-class hospitals. Third-class hospitals are afraid to talk about diarrhea in their nursery, so they send the babies home or transfer the baby to The Cradle; as a result we do have admissions from time to time that have diarrhea at the time they are admitted. Since the new technic was instituted by Dr Gladys Dick, there has been no evidence of spread from baby to baby.

Dr Herbolzheimer: What provisions are afforded by the administration for sick nurses to refrain from reporting for duty? Is there a penalty attached if the nurse is not on duty? Is sick leave provided with pay so that employees in the nursery would be encouraged to take advantage of the sick leave with no reduction in pay?

Dr Sauer: I don't know anything about that phase of the administration but I would say it would be of interest to the institution to develop a good policy for personnel.

Dr Sauer continued that it does not cost a lot of money to provide the necessary equipment and conscientious nursing care. No matter what the training of the nurse is, she must be instructed to comply with the rules. Furthermore it is not necessary to take the baby's temperature all of the time. The object is for the personnel to spot the first case of diarrhea as early as possible. If a case is a suspect, other babies should not be admitted into that ward and all the procedures should be checked at once. We have had sporadic cases of diarrhea occurring in The Cradle from time to time and we believe that most likely the germ was brought into the nursery by the infant. Sometimes there is a dormant period and then all of a sudden symptoms appear. The infant had the diarrhea and if during the incubation period some articles were contaminated the nurse runs the possibility of transmitting the germ. In The Cradle our technic has been so good that we have had no cross-infection although there have been admissions with diarrhea.

Parents would be glad to pay extra for coverage of the cost necessary to provide excellent neonatal nursery care. Mothers who go through a pregnancy

want protection for their newborn infant. I know the technic at the Cradle works and gives assurance to the management of the institution. I do not think there is any question about it.

Dr Cline: Please discuss the value of masks in the neonatal nursery: There has been a lot of discussion as to the value or invalue of the masks. I should like to have you say a few words on that.

Dr Sauer: The Drs Dick always felt strongly that masks were necessary for carrying on a good nursery technic but that these masks should be of the best material, be properly worn, and not touched by the fingers after put in place. Masks should be sterile before being put on and should fit over both the nose and mouth. You are all acquainted with the moving picture showing what happens when a person sneezes. A mask would be protection against airborne infection coming from the nasopharynx of those working in the nursery. I do not know definitely of how much good the mask is, but I think that one is less likely to spread respiratory infection when the added barrier of a mask is present. I do not think the mask technic would prevent the spread of enteritis but it would prevent the spread of germs and viruses that cause colds and other respiratory infections. I know that physicians are reluctant to wear masks. I think masks are an added precaution for all. The Dicks have insisted that all parties entering the nursery wear masks. This policy has been carried on from 1928.

Question: How often do they change masks?

Dr Sauer: The mask is changed when it becomes moist or when the wearer goes out to lunch, or is changed frequently when she has a cold. We have allowed nurses with colds to stay on duty provided they use good mask technic.

Sister Justina: What hand technics have you inaugurated for use by the mothers before the baby goes out to nurse.

Dr Sauer: We have no mothers at the Cradle. At the Evanston Hospital the mother cleanses her hands with an alcohol sponge prior to the time that the baby, wrapped in a carrying blanket, is brought to her. The mothers do not have enteritis. I feel that the infection of the baby comes from someone besides the mother.

Sister Justina: Do you think it is necessary to ask obstetric patients on admission if they have had diarrhea?

Dr Sauer: I don't know about that point. Of course I strongly believe that maternity hospitals of the future will be entirely different than what we now have. When a woman comes into the hospital perfectly well in order to give birth to a baby, she wants security for both herself and her unborn child. Maybe she is poor or perhaps her husband can give the institution a large donation. This mother wants security, and she wants her offspring to be well. It is the duty of the hospital to give such patients all possible security. By individual mask and net technic, with individual assignment for the feeding and diapering, the infants security can be enhanced. A lot of expensive equipment is not necessary but every one connected with the administration of the nursery should try their best to carry out good technic. It is my firm belief that infection is spread by the hands of the attendant. Each baby should have its own supplies so that care can be given to it in its own unit.

With regard to the formula, if you autoclave it at 15 lbs for a reasonable time with the nipple on and a gauze cover over the nipple, you do not need an ice-box at all, provided that the formula is used in 24 hours.

Dr Boyd: I want to thank Doctor Sauer for his discussion.

Another important phase of the problem of diarrhea in the newborn is the epidemiology. We are happy to have Dr Jerome J Sievers, Chief of the Division of Communicable Diseases, to discuss that aspect of the problem. Dr Sievers.

EPIDEMIOLOGY AND REPORTING

by

Jerome J. Sievers, M.D., Chief
Division of Communicable Diseases
Illinois Department of Public Health

I feel very humble to be included on this program between two such experts as Dr Sauer and Dr Watt.

My experience with this disease has been more theoretical than practical. There is as you know much to be found in the literature on the subject of epidemic diarrhea. The epidemiology of epidemic diarrhea of the newborn is much like polio: we have a lot of information but it is entirely on the negative side. That is not, however, too bad a thing. It shows the need for further study.

Epidemic diarrhea is certainly an important disease not only to the individual mother and child but also to the Health Department which is interested in and points with pride to low infant and neonatal mortality rates. As Dr Sauer mentioned there has been much study by various investigators on the etiological aspects of diarrhea. The Dicks studied the causative factor in that particular outbreak at The Cradle. There are other organisms that might have been the cause of that outbreak. A great many investigators have indicted practically every form of strep and forms of staphylococcus and various bacilli. But no organism has been convicted, at least to the satisfaction of this one man jury. In fact some of these organisms are still classified as pathogenic organisms because they were found in one epidemic but never again found to be associated with disease. There has been much discussion recently of a virus as the cause of this disease. Very interesting work has been done in our own laboratory here in Illinois which seemed to indicate that a filter passing agent obtained from tissue caused diarrhea in certain experimental animals. There was also work done in Philadelphia about three or four years ago on filter passing agents. I hope that Dr Watt will discuss this aspect a little later. He certainly has a good deal of information.

The summary of numerous outbreaks points definitely to the fact that regardless of the agent concerned, the disease affects neonatal infants.

The incubation period is about seven days although it varies considerably. Most of the group of cases will fall in the period 2 to 16 days but the spread varies from one day of life to 33. There has not been any satisfactory evidence of the spread of this disease to adults especially those adults who are newly exposed or caring for the infants. There is much talk of diarrhea in communities at the time of outbreaks, but the diarrhea we hear about happens before the outbreaks, not coincident with it or subsequent to it. The same is true with diarrhea among the nurses which seems to precede rather than follow the outbreaks in infants.

As for sex of the infants affected both sexes are equally affected, nor is there any difference with respect to color.

As far as socio-economic condition the outbreaks have occurred in all groups.

All infants show marked susceptibility, but prematures are prone to attack.

Insofar as feeding is concerned there doesn't seem to be any significant difference between breastfed or artificially fed babies. One must recognize however that under present circumstances there are not very many purely breastfed babies. Practically every hospital gives some supplementary feedings. The babies are not put to breast until the third day. Usually something if only water is given within that period.

The seasonal incidence is not particularly significant. There does seem to be a higher rate in spring and the summer months.

Geographic distribution is of some interest. The largest number of outbreaks have occurred in the north temperate zone.

There does not seem to be any doubt about the contributive factor of the increasing number of deliveries and increasing demands on the institutions. I think that facilities have not yet met the demands for hospitalization, especially during the war years. With so many factors that encourage hospitalization, the rate of deliveries in hospitals has gone up, but the facilities have not kept pace. We are also faced with the shortage of nursing personnel. Some trained nurses have not received proper supervision in maternity and communicable disease techniques. All of these defects must be considered in conjunction with the susceptibility of the newborn and the remarkable tendency to spread of this disease from baby to baby. To be perfectly honest, we have to admit that the disease will develop in a nursery where the outward appearance is good. The mode of spread of epidemic diarrhea as in polio is not established.*

The primary case of epidemic diarrhea of the newborn occurs unsuspectedly. After the initial case there very often is a very irregular period in which there are no obvious cases and then there develop secondary cases. If we were able to recognize the first case of epidemic diarrhea of the newborn I am sure that it would be possible to spare some of the losses that the disease causes. The difficulty is recognizing the first case. In fact the very definition of epidemic diarrhea of the newborn raises doubt whether

*As in polio, there are two schools of thought on the mode of spread: respiratory and gastro-intestinal.

anyone can diagnose such a condition in one case. Perhaps the name is unfortunate. When this particular period of the primary case is not immediately recognized and measures of control are not used the epidemic gets into full sweep and there occur further cases and deaths. Some believe that spread occurs from baby to baby in adjacent bassinets. Consideration must be given as to whether or not the nurses serve as carriers of the disease.

In unsuspected and uncontrolled cases exposed babies are discharged in apparently good condition from hospitals and later return to the same hospital or to another hospital in critical condition. In some instances babies become sick at home and die there and the cases are not reported. All of these practices are due to the fact that control measures are not put into effect. This means that there should be prompt reporting of the disease. Certainly if one is sincerely and honestly interested in preventing the occurrence of the disease or in bringing an epidemic to a close he should recognize that every infant that develops abnormal bowel movements is a potential case and must be isolated. There is no other way to face this problem. Certainly if one fears the control measures of the Illinois Health Department he should fear more the possibility of the deaths and terrible losses against the hospital. Therefore nothing in the long run is gained by not reporting the cases. Much can be saved. As I say, hospital administrators and physicians may not want to report the case but if every case of abnormality of bowel movements were isolated surely the appearance of two or three cases would define the cause. Certainly if two or three cases occurred there should be no reason for not reporting to the State Health Department.

The control measures are well known. No epidemic of this disease is controlled until the nursery is closed and the admissions to the nursery suspended. Such a step as closure of maternity services in a hospital causes considerable inconvenience but the inconvenience that it does cause is certainly better than the fearful mortality that occurs.

The prognosis is in general very poor. The figures indicate that the attack rate of babies exposed is 15%. I think that is a little low, it is probably closer to 25%. The mortality rate varies, it is about 50%. It is even higher in premature infants. The time of institution of treatment and the quality of the treatment are recognized as having some influence on the outcome of cases. The question of mortality and fatality rate is interesting because we have had epidemics of the newborn in which there were no fatalities. The question arises: was the diagnosis correct? I am not prepared to say but reported epidemics in literature credit the disease with a high fatality rate.

I know many investigators feel that this condition is not a definite entity. Prior to 1928 it was not recognized. Other investigators who have studied the disease say that it can be recognized as a clinical picture. I should like to close by quoting from Frant and Abrahamson in Brenneman's Practice of Pediatrics: "In general it is true that a common etiology need not be postulated for diarrheal disorders of early infancy. Likewise at this time the common clinical expression of severe diarrhea and its associated symptoms may be induced by a wide variety of organisms. But symptoms and signs alone are not the determinants of a disease entity. In final analysis, a disease entity is established rather by a constant and characteristic relationship

of its symptoms and signs to each other, their sequence in time, their course and duration, and the circumstances underlying their occurrence. It is, therefore, quite important to realize that we are considering not merely a diarrheal condition, but a definite clinical syndrome of undetermined cause, whose distinctive and constant features serve to separate it from the general group of diarrheal disorders of infancy."

DISCUSSION OF DR SIEVERS' PAPER

Dr Sauer: I do not want to monopolize the discussion but while I am in Springfield I want to get to the crux of this problem. I think it is everybody's problem. If in any community there is a hospital with diarrhea of the newborn they should be honestly frank and report to the authorities and have authorities have a group of well qualified men in communicable disease go there, stamp it out and close the nursery. The authorities should be equipped to tell the people what to do. To close up the maternity hospital and not tell them what procedures to follow is not intelligent. Mothers then go elsewhere and conditions there are not any better. Here we are dealing with a disease of a very high mortality with cases usually crowded in little nurseries where technique is very poor. One break in technique may be disastrous. I speak from experience. I furthermore think until everybody where babies are born knows the right path it is the duty of the State Health Department to send crews there. Check up on the hospitals and their techniques, give them a grade on how well they are living up to standards. Institutions are not entirely honest and try to hush up undesirable situations.

Dr Piszczek: I should like to re-emphasize the importance of early recognition of diarrhea and to encourage the hospital to acknowledge the occurrence of diarrhea. Recently we in Cook County had an experience where fourteen babies had developed diarrhea. We had a total of 22 cases without a single death. Our cases developed between 33 and 60 hours after birth. The early and honest recognition by the hospital that they were in trouble was very advantageous in saving the babies. The hospital went overboard to meet the needs with nursery staff. Painters and cleaners worked 16 hours with one aim in view--to do everything possible. Let's have courage and recognition. We can never tell what the incubation period will be. If it is 7 days most of the cases will develop at home. It has been my experience that most have developed in hospitals.

Dr Boyd: In January 1945 we went down to Tulane University where we heard a lot of references made to Drs Hardy and Watt when dysentery was discussed. We are fortunate to have Surgeon James Watt, US Public Health Service, National Institute of Health from Washington D C with us today -- Dr Watt.

STATUS OF RESEARCH ON ETIOLOGY

by

Surgeon James Watt
U. S. Public Health Service
Division of Infectious Diseases
National Institute of Health
Washington, D. C.

There is not a whole lot left for me to say about diarrhea of the newborn. The subject that has been given me is one that I could step out of in a few minutes because actually we don't know the etiology. We have a lot of theories. I think about as many theories as people who have worked on the disease. The literature is full of references to various micro-organisms isolated from the stools of large numbers of babies who had a diarrheal disease in the newborn nursery.

Personally I think the term epidemic diarrhea of newborn is extremely unfortunate, I think it falls in the same classification as diarrhea and enteritis as a cause of death. The diagnosis provides a very convenient waste basket for the doctor who feels no need for specific etiologic diagnosis. Any mother could make the diagnosis diarrhea and enteritis just as well as a physician.

Just as we have listed as a cause of death, diarrhea and enteritis, we have as a clinical entity a disease we label as epidemic diarrhea of the newborn. In the name we have a definite description but we have nothing about the pathology of the disease. In good medical practice that just doesn't go. We expect doctors should definitely be very reluctant to put a name on any disease or to call anything a disease unless they know the definite single etiological agent back of it. In the diarrheal diseases which we have been working on for a number of years there are not single agents involved but many. The agent varies with part of country or the population group with which we are working. The same thing I think is a potential factor in any diarrheal disease in any age group. As far as I know no disease that we have in epidemic form is without its endemically occurring cases. If we suddenly have in the newborn a disease that occurs in epidemic form and there is no such thing as endemic form we have a very peculiar situation that does not have a parallel in other infectious diseases. For that reason to think of "epidemic diarrhea of the newborn" as diarrhea in the nursery which occurs in epidemic form only is bad from the point of view of hospital administrators. It is safer to consider it as endemic and to focus attention on the way it may be spread.

As to the status of research on these diarrheal diseases of the newborn almost every possible micro-organism you can name has been given some sort of etiological significance in these outbreaks. The thing that appeals to the man who is interested in the laboratory side of it, is the isolation of a definite causative organism. Various papers in the literature show that the great majority of workers simply state that "this organism" was

isolated or not isolated, "the stool cultures were negative" or some non-specific statement. No detail on cultural methods are given. As you realize, the type of laboratory procedure and all the various human factors can make a terrific difference in results you get in a laboratory. Dr Sauer mentioned the Dick studies. Even with the media developed by the Dicks they were far behind our present status with regards to good culture media for doing diagnostic work. The big problem which we have is the fact that we have a very large number of organisms present in stools. No single medium is designed to isolate all of these particular organisms. Any medium that will grow them all is certainly not designed to permit the more fastidious to grow equally well. We are up against a definite problem in being able to isolate any organism. We have a further difficulty in the type of stools of these little babies who are on a purely milk diet. There are many organisms as in adults, but the percentage of viable organisms is larger. Consequently when we plate the specimen out it is far more difficult to isolate organisms. The plate is likely to overcrowd and we are unable to distinguish organisms or to select colonies for study.

In the study of an outbreak in the nursery of a hospital in New Orleans, I had pointed out to me the difficulties in laboratory diagnosis in infant diarrhea. We did a culture on all cases and attendants in the whole nursery. We found a single recognized pathogen in one of the children. Fortunately we used an enrichment media along with other media. We were able to isolate the organism from five other cases. This particular pathogen was introduced into the nursery from the mother. The child was exposed to the mother at birth. It was immediately isolated and taken to the nursery and never saw the mother again. (Since this was a premature nursery we do not permit the children to leave the nursery.) The mother had a stool culture which was strongly positive for the organism found in her child and suspected in all other cases. That is one way diarrheal diseases get into your nursery. There were six cases with two deaths in this epidemic. I saw another outbreak in the same nursery which occurred sometime later. There we were never able to isolate an organism that has any definite relationship to diarrhea. The distribution was spotty. It skipped across service walls. It didn't seem to be bothered by barriers. It was found to be due to a very definite break in the technic of feeding. We have in the literature other instances in which the situation is suggested. In this latter instance there seems to be a relation to the occurrence of Pseudomonas infection.

In the study of endemic diarrheas we find organisms not found in the stools of perfectly normal babies. The question is where did the child acquire these organisms. We have done culture work on children and also on their mothers. We found that commonly we can tie a tag on the organism in the mothers stool. The first organism some 18 hours after admission to the nursery is usually one of the organisms gotten from the mothers' stools. The child when it comes into the nursery is likely to have some exposure to infection and is not the little sterile bundle commonly believed.

I do think that in the investigation of the diarrheal disorders we have got to weed out an awful lot of information which may be half true, part true and whole true. It is all mixed up. We just don't know where we stand. I have read articles on diarrhea and have tried to find out what technics were used in studying the particular outbreak. It is extremely difficult

to learn the exact way in which others have studied their cases. One can get entirely different results depending on the way the particular work was done. We would like to be able to say that we have tried to duplicate a given man's technic. It is extremely difficult to get that sort of information from the report of the studies of these diarrheal outbreaks. For that reason investigators have almost got to say "we just don't know how to proceed". They must proceed on the assumption that it is material taken from infants and should be studied exhaustively even though not necessarily according to the pattern of stool analysis acceptable for such studies in adults. After this premise we can then begin to decide as to causative bacteria or viruses. Virus work is extremely tedious and complicated. We are immediately confronted with the problem of no satisfactory laboratory experimental animal. That is one of the biggest drawbacks. Every animal we know is susceptible to diarrhea. The veterinary literature is full of descriptions of outbreaks in various animals. We have in practically every animal a disease picture, a clinical picture that will fit into the human picture. We get such a disease in these animals, we can't be sure that we are dealing with the particular inoculated disease or a natural disease peculiar to the animal. The same thing holds in these diseases of animals; we do not know any more about etiology than we do in a human.

One of the most important approaches to the study of the disease is to see if we can't find out what the diarrheas that occur are really caused by. These are not epidemics but isolated cases. Once we can find out the organism or group of organisms that are causal in these isolated cases then we can be in a position to do something to isolate the agent or agents that are involved in outbreaks. Personally I think we are going to find that epidemic diarrhea of the newborn is not a single disease entity. I think these outbreaks are caused by many organisms. It is not going to be a single disease, therefore we cannot set up individual barriers. I think we will probably be able to find eventually a group of organisms is involved and the technic is going to have to be so designed to take care of all possibilities. The technic is going to have to be different from that used at the Cradle. Such technic is not possible in the average hospital.

One has to do something to bring the loss of infant lives from diarrhea to a stop. The laboratory man can help to a certain extent, but certainly not if he is dealing with a non-recognizable agent. Careful bacteriological study should be done but don't expect too much from this at the present state of our knowledge. The next thing is the hospital administration's point of view: it is most important to emphasize that each and every child in a nursery is not a potential infectee but a potential source of infection. I think that it is important to keep in mind that when a baby develops diarrhea the incubation period has been going on for some time. The child has been infected sometime ago. That is particularly true with salmonella infections. Sometimes 2 or 3 days elapse before clinical symptoms appear. If we do not consider that each and every child is a possible source of infection then we are likely to concentrate all efforts on therapeutic aspects after clinical disease has been established rather than on prevention. It is not so much the idea of preventing a particular child from getting an infection but the idea of holding any infection to that individual child who may have some immunity or adjustment to it. When there is a child sick you have no trouble with isolation of that one baby. That child is handled as a unit. The test is to

keep each child happy with the bugs he has acquired. You may have some cases of diarrhea but by this procedure you will at least not be confronted with epidemic diarrhea of the newborn.

Dr Boyd asked that discussion on Dr Watt's speech be postponed until the afternoon.

Recessed for lunch.

Afternoon

Dr Boyd: The program this afternoon consists of panel discussion on the responsibility of the Illinois Department of Public Health as related to Maternity Hospitals. I would like at this time to call upon Dr Henrietta Herbolzheimer, Chief of the Division of Maternal and Child Hygiene who will introduce the panel.

Dr Herbolzheimer: Thank you Dr Boyd. The speakers on the panel this afternoon are responsible for implementing various facets of the problems that were discussed in this morning's session. In such panel as this we approach the "Information Please Program", only unlike the eminent Mr Fadiman, I do not have the answers typed in at the bottom of the page. We have only the questions.

The speakers today represent people whose day to day work brings them in contact with maternity hospitals. Too, many of our guests have had intimate contact with one or more epidemics of diarrhea of the newborn.

While we have had excellent cooperation on the reporting of cases, it is quite apparent that our records in some areas are very inadequate. Therefore it is not possible to state exactly how many cases per annum are involved in this disease. In the summer of 1946 there have been eleven epidemics totalling 115 cases that we know about and 39 deaths attributable to epidemic diarrhea per se. In addition there were about 20 other deaths signed out as epidemic diarrhea of the newborn in institutions that did not have epidemics. Those cases might have been the odd instances mentioned by the speakers this morning that were infants who brought their own bugs into the nursery and developed diarrhea. Perhaps the technics and other circumstances in those institutions were such that spread was not possible; or probably other cases were not recognized and reported.

Our discussion this afternoon centers on the problems relating to the cooperation of maternity hospital, the health department personnel and directly and indirectly the obstetric patient. I have asked Dr Newberger, Consultant in Maternity, to present a discussion of the direct responsibilities placed upon the Health Department through the requirements of the Maternity Hospital Licensing Law. Dr Newberger.

THE MATERNITY HOSPITAL LAW AND MEASURES FOR PREVENTION OF
EPIDEMIC DIARRHEA IN NEWBORN

BY

Charles Newberger, M.D.
Consultant in Maternity
Illinois Department of Public Health

The Illinois Maternity Hospital Law of 1915, as amended in 1939, dealing with "the licensing, inspection and regulation of maternity hospitals", placed the responsibility of the State Department of Public Health for the formulation and enforcement of standards for the conduct of such hospitals. The job of setting up the regulations and the task of putting them into effect were delegated early in 1940 to the Department's Division of Maternal and Child Hygiene. At the present time these rules are being revised on the basis of the accumulated field experience during a six year period by the Division's Consultants in Maternity, Nursing and Nutrition. Aid in this process of revision is afforded by the active participation of the Division of Sanitary Engineering, by the valuable assistance of the Advisory Committee to the Division of Maternal and Child Hygiene, by counsel given by representatives of the Illinois Hospital Association, by careful study of the related publications of the U.S. Children's Bureau, and by the painstaking review of similar regulations promulgated by Health Departments of many other states. The rules deal with the various phases of hospital construction, sanitation, physical set-up, maintenance, facilities, equipment, personnel, food service, technics and procedures. Their common aim and their single goal is to assure the safety and well-being of mothers and newborn infants. There are a number of regulations particularly concerned with preventing the introduction or spread of communicable diseases. These include the following, gathered from the various sections of the proposed revision:

1. Admission routine. The responsibility for effecting precautionary measures against admission of actual or suspected infectious patients rests with the hospital admitting officer and the obstetric supervisor.

Patients with known infectious diseases or giving a history of contact with diarrhea, respiratory or skin infections or other communicable diseases within one week preceding admission to the hospital, shall not be admitted to the regular maternity division.

2. Segregation of obstetric division. The obstetric division shall be physically segregated from all other services in the hospital. Beds designated as "obstetric beds" shall be used exclusively for maternity patients. Maternity patients shall not be placed in the same room with other types of patients.
3. Patient rooms and nursery. Rooms for patients shall be outside rooms, well lighted and well ventilated; there shall be a minimum of 800 cubic feet of air space for each patient, and a minimum of three feet between beds. The nursery shall be large enough to provide a minimum of 250 cubic feet of air space for each bassinet and a minimum of 18 inches between bassinets.

4. Special delivery room. Patients who present evidence of infection, or possible infection, shall not be delivered in the room provided for clean obstetric cases.
5. Handwashing facilities. Ample provision shall be made in the labor and birth rooms, in the nurseries and in the doctors' examining rooms for hot and cold water handwashing facilities equipped with arm, knee or foot controls.
6. Isolation of mother. Special facilities shall be available for the immediate isolation of all mothers:
 - a. who were delivered outside the maternity division;
 - b. who on admission present a history of exposure to infectious diseases within the preceding seven days;
 - c. who have fever or additional evidence of infection, or other conditions inimical to the safety of other maternity patients.
7. Isolation of infants. Special facilities shall be available for the immediate isolation of all infants.
 - a. who were born outside the hospital;
 - b. whose mothers are isolated;
 - c. who have, or are suspected of having, fever, skin lesions, inflammation of the eye, diarrhea, or other evidence of infection.

If the infant has the same infection as the mother, it may be isolated with the mother in a private room.

8. Formula room and preparation. A room isolated from any source of contamination shall be designated for the preparation of formulas. The nurse who prepares formulas shall wear cap, mask, and sterile gown, and shall employ sterile equipment and aseptic technic.
9. Personnel. A separate nursing personnel shall be provided for the obstetric division. These nurses shall neither attend patients in other divisions, nor come in contact with infectious patients or infectious material.

All attendant staff before assignment to the maternity division shall be examined. The examination, which should include an x-ray of the chest, shall be done by a physician designated by the hospital management, who will certify to the administrator that the person is free from communicable disease. The personnel in the obstetric division shall be educated to report to the supervisor sore throats, colds, diarrhea, or other signs of abnormal health.
10. Exclusion of sick personnel. No one with an upper respiratory infection or other acute contagious or infectious disease, or a presumably infected wound or lesion, shall be permitted to work in the maternity division or food-processing rooms, or to handle milk, food, and food utensils, until examined by the designated physician, who shall certify that the person is not a disease carrier. If the administrator suspects that any person has contracted any communicable disease or has become a carrier of such disease, he shall immediately notify the local health authority.

The administrator and the employee are jointly responsible for the observance of this regulation.

11. Records. Complete records of the mothers shall be kept of all observations, and of the temperatures taken four times daily. Records of infants shall include the number and character of stools, the condition of the skin and eyes, the reaction to feedings, the weights at birth and the daily weight, and the temperature taken twice daily.
12. Reports. The administrator shall report immediately each case of a communicable disease or suspected communicable disease to the local health officer.
13. Visitors. Patients shall be permitted no more than one visitor per day. Children under 16 years of age shall not be admitted as visitors to the maternity division. No visitors shall be admitted who have an infectious disease, who have recently recovered from such a disease, or who have had contact with such a disease. Visitors shall not have contact with infants at any time and shall not be admitted to the delivery room or nursery. Visiting hours shall not correspond with periods during which the infants are with the mothers. Visitors shall neither sit nor place their clothing upon the beds.

These rules and standards are quoted and brought to the attention of this group because they are of fundamental importance in the prevention of any of the reportable diseases of the newborn. They assume even greater significance in considering epidemic diarrhea of the newborn because of the insidious onset of this disease. Failure of observance of any of these regulations or of their enforcement may be the cause of the introduction and spread of one or another of the communicable diseases.

Constant alertness and unceasing awareness on the part of hospital administrators, medical and nursing staffs and health officers should lead to the safer conduct of maternity divisions in hospitals and to the lessening of maternal and infant morbidity and mortality.

Dr Herbolsheimer: Thank you very much Dr Newberger for the detailed discussion of standards for safe operation of maternity hospitals.

As is quite apparent there have been from time to time different concepts of regulations for the provision of safe obstetric services in institutions. In the early days the mothers and babies were kept in the same bed; then we changed to the practice of having the babies in one large nursery. It was mentioned this morning, at this stage of the game, we are again thinking of changing the provisions for optimal care of newly born infants by the provision of multiple small nurseries not exceeding eight or ten bassinets in size. In some institutions even smaller nurseries are being established but this is at present in a highly experimental stage and merits serious consideration before application on a statewide basis. As many of you know the Division of Maternal and Child Hygiene confers with architects regarding all new construction and reconstruction involving the maternity department of a hospital, with the end in view of building an efficient and safe operating plant.

The Department depends upon frequent visits to maternity hospitals by our staff of consultant nurses especially trained in maternity and neonatal pediatric nursing technics. These consultants become after a while quite expert in sizing up local problems at a glance and oftentimes they are able to see errors in technic that those in charge of the obstetric department are much too close to the situation to realize. Furthermore it is the responsibility of these nurses to evaluate nursing technics so that if there are any possible short-cuts that can be applied in a given institution, they can be so applied with the knowledge of the safety of the procedure. I have asked one of the Maternity Consultant Nurses on the Division's staff to share with us some of her experiences. I should like to present Miss Edna Heyde.

CONSULTANT NURSE FOR MATERNITY HOSPITALS

by

Miss Edna D Heyde, RN
Consultant Nurse for Maternity Hospitals
Illinois Department of Public Health

Consultant nurses with the Division of Maternal and Child Hygiene have duties so extensive and diversified that it is often difficult to know how much detail to cover, lest we go into trivialities and lose sight of the goal.

First and foremost, the nurse makes periodic visits and "takes in" all she can during these visits. Visits are made from time to time; they may be daily, they may be weekly, they may be monthly, or they may be every six months but there will always be a prelicensing visit. The need of the hospital is a determining factor.

Our objective is to instruct in the intelligent and safe care of mothers and babies. To a great extent that involves emphasis on the prevention of infections.

Our basis of operation is obstetrical textbooks, reinforced by conferences at maternity hospitals of reputed standards, and the State nurses' organizations.

Perhaps it would be of interest to follow me through a routine visit. I call on the administrator and am given an opportunity to discuss mutual interests. Very frequently, the question is asked: "Can you tell me where I can hire a nurse?" or the statement is made, "We haven't enough nurses". It seems that most hospitals are considerably understaffed and have personnel untrained and unacquainted with the aseptic details of nursing. In many places, the physical plant leaves much to be desired. Sometimes I am sent to the obstetric department before seeing the administrator or director of nurses. Sometimes one or both accompany me. The same routine cannot always be followed, as institutions vary. The qualifications of the supervisor are noted if the supervisor is new; the number of registered nurses on duty round the clock; the number, if any, of students and the number of attendants is likewise noted. Usually in a few minutes discussion, many of the things in which I am interested can be checked. After a short visit, I am asked to go through the department and while doing this, technics can be observed and discussed, routines talked over, questions asked and problems clarified or referred. I have found that most people are friendly, wish to cooperate and are anxious to get new ideas and facts.

One of the most frequent questions is how the nurses prepare for the nursery. Nurses coming on duty should change to gowns worn only in the obstetric department. These gowns should have short sleeves. Caps or nets to completely cover the hair should be worn. As explained by Dr Sauer, proper hand washing and hand scrubbing technics are of the utmost importance. These as defined in the little posters so kindly made available to us by Dr Sauer are as follows:

ASEPTIC HAND WASH

1. Don Clean Gown and Mask.
2. Cleanse Hands and Forearms.

3 MINUTE SCRUB

Before Entering Nursery

After Handling "Infected" Infant

After Touching Infectious Material

After Using Handkerchief

TECHNIC

1. Wet hands and forearms under faucet.
2. Lather and scrub with liquid soap and clean brush.
3. Rinse under faucet.
4. Dry on clean individual--or paper towel.
5. Distribute about 2 CC. (30 drops) 70% alcohol on hands and forearms.
6. Allow to evaporate.

1 MINUTE WASH

Between Well Infants

After Handling Diaper with Stool

After Touching Mask, Door, Light Switch, Etc.

TECHNIC. Same as above (Except no Brush).

Facilities for hot and cold water with foot-, knee-, or arm-control should be provided. Sufficient towels for each washing and liquid soap in the soap dispensers should be available. Lack of both of these has been noted. Also a common towel has been found. Basins with antiseptic solution may be used as a substitute sometimes, but care must be used that the solution is changed often. The value of soap and water, plenty of it, cannot be too strongly emphasized. May I reiterate with emphasis the importance of handwashing - thorough handwashing.

To weigh the infant, cover the scales fully with a clean diaper if large enough or a paper sheet, so that the infant in no way comes in contact with any undrape.

surface. Small sterilized papers can be used for moving weights and recording weights. There are scales which balance themselves correctly, thereby obviating the necessity of shifting weights.

In most hospitals the method of infant bathing is decided by the medical staff. The method is not so important as the technic used. It is not what is done but how it is done. Many nurseries are too crowded. Bassinets have been found touching each other and on racks, making it impossible to handle linen without contaminating the crib on either side. The ideal cribs are those that have all equipment for individual care. But, lacking these, a table with necessary equipment for each crib can be rolled to the crib or vice versa. Individual bassinet techniques are mandatory. Each infant must be cared for in his own crib. Individual bath packs are necessary. These contain the necessities for crib bathing. Newer concepts are 8 to 12 babies per nurse. Babies are sometimes pushed aside and neglected by each shift of nurses. Hospital policies will place the responsibility for care.

Dr Sauer has explained the importance of the "commissary squad". Water bottles should not be left in the corner of the crib nor should the nipples be left uncovered as I have seen done. Remove bottle from the nursery after use. Do not prop bottles. When the infant is picked up to "burp", it should not come in contact with the uniform, gown, mask or face of the nurse. Each infant should have its individual set or properly labeled bottles for each 24 hour feeding. Storage of bulk formulas should be prohibited.

Formulas should be prepared under strict surgical asepsis. Variations noted are: bottles stored in refrigerators with other food; formulas made in diet kitchen when other procedures are being carried on; formulas made in odd places i.e. hall, storage room, etc; nipple jars carelessly covered; bottles carried down the hall with nipples uncovered. Small but firmly made paper sacks for covering nipples made to cover the entire bottle are on the market now; or the muslin cover to cover the nipple and neck of the bottle and firmly fastened with a rubber band may be used. Lids on sterile supplies should be put on securely and contents should not be left uncovered except to get needed supplies.

Now the problem of the doctor and the nursery. An anteroom with facilities for handscrubbing and an available gown should be provided for the physician. All examining instruments should be sterilized after each use and freshly sterilized linen should be placed on the physicians examining table before use. Physicians have been seen going into the nursery without scrubbing or wearing a gown. The nursery supervisor must be educated to correct this dangerous procedure in behalf of the interest and responsibility of the hospital.

Equipment of the nursery should be limited to furnishings and supplies necessary for immediate use of the infant. Draperies, floor lamps and unessential storage should be dispensed with. Equipment should not be elaborate, if there is extra money to spend, spend it on well-trained personnel.

Keep records intelligently - much is on charts that is irrelevant, much is off that should be included. Much could be taught about recording. Make records mean something. Do not record such insignificant items as "sponge bath"; "takes feeding well". It is important to know the condition of the

baby when it came to the nursery, the daily condition of the skin, eyes, mouth, cord, weight, kind of stool and frequency. Record the amount of feeding given, whether it was retained, or only a part retained. Is the baby listless, does it cry a lot or does it seem hungry? Some hospitals have records for check methods. These save time, but records should give the accurate condition so that a complete history is obtainable. Charts are frequently found that give no picture of the infants clinical condition and this is unfortunate when certain occasions arise.

Often breaks in technic are due to a lack of supervision. A supervisor or nurse may be good but is overweighted with administrative duties. Streamlined technics could be expedited without risks - a short cut is a gamble and while it may serve for a time, is far too risky.

Soon after the first department visit, if possible, the administrator or director, or both, are visited again. This nursing consultant service can be of real value or earnestly desires to be.

There is a definite need for good nursing technic in hospitals throughout the State and when such technic is established, there must be a constant alertness and vigilance against violations of these standards.

Dr Herbolzheimer: Part of our regular inspection team and a very important part includes one of the staff of the Division of Sanitary Engineering. Mr Hendrix has been assigned to the task of routine inspection of maternity hospitals from the Division of Sanitary Engineering for a number of years. During the war years there wasn't much that could be done about the plumbing equipment, sterilizing equipment and risk of cross-connections and it was during this time that Mr Hendrix was in the Armed Forces. Although some of the points important to Sanitary Engineers seem a little remote to the problem of diarrhea of the newborn, we must, until we know more about the etiology of this disease apply the best that Sanitary Engineers have to offer. Mr Hendrix.

SANITARY ENGINEERING ASPECTS OF SAFE HOSPITAL CARE

by

George K. Hendrix, Senior Sanitary Engineer
Hospital Sanitation Specialist
Illinois Department of Public Health

Under the authority granted the State Department of Public Health under the Maternity Hospital Act enacted in 1939 certain standards of sanitation were set up along with medical standards. The sanitary standards concern themselves with sanitary equipment and sanitary practices within the hospital. The allotment of time does not permit me to discuss each of the items in the present so-called regulation or those that will be found in the revised edition which will be available in the near future but I should like to consider the important points in which you as a group are interested in connection with epidemic diarrhea.

First of all, let us consider the water supply. The water supply should be of safe, sanitary quality. Most of our hospitals in Illinois do have a safe municipal water supply. A few hospitals, however, but not too many, use a private water supply located on the hospital grounds. It has been the experience of sanitary engineers of this Department, that it is almost impossible to develop and maintain a private well located in any built-up part of the city and expect to get a safe water supply from that well. In almost all cases, the well will become contaminated by seepage from unknown sewers, drains, etc. Where city water is available, it should be used. Water for infants should not be taken directly from a tap and be served without further treatment. You will recall that Dr Sauer pointed out that everything that touches an infant's lips should be sterilized. The quality of drinking water may be safe for adults, but this does not mean that it is sterile.

Another item of importance is the milk supply. The Maternity Hospitals Standards state that all milk being used, other than powdered, condensed or evaporated shall be properly pasteurized milk. Milk used for cooking, as well as for drinking, should also be pasteurized. A few hospitals are still continuing to use raw milk entirely although some do provide pasteurized milk for the patients. This practice is extremely hazardous because one cannot tell the difference between a glass of raw milk and a glass of pasteurized milk set side by side. There is no difference either in appearance or taste, but there is a distinct difference in bacteriological analyses of these two types of milk. In our new standards, we are going a little bit farther by asking that milk to be served to patients be delivered and consumed from the original $\frac{1}{2}$ pint container. This may seem like a harsh requirement, particularly from the standpoint of hospital administration, but I am sure you will agree with me that this practice is far superior to the one which I shall now describe. Suppose you obtain your milk, even though it be pasteurized, in 10 gallon cans. This milk is usually dipped from the can and placed in a pitcher. From the pitcher it goes to the individual glass and eventually reaches the patient. That milk may have been pasteurized and perfectly safe when it reached the hospital in the large container, but the amount of contamination in that milk by the time it reaches the patient is questionable. Such a practice makes it almost impossible to avoid picking up contamination as the milk is transferred from one container to another. The ideal way of dispensing milk is to take the $\frac{1}{2}$ pint bottle of milk to the patient on his or her tray with the cap still on the bottle. The nurse or maid should remove the cap at the bedside and permit the patient to consume it directly from the bottle, either through a glass tube or a paper straw.

With regard to the storage and refrigeration of food, the first thing which should be considered is the proper selection of a room or space suitable for storage. In my opinion this is one item which has been grossly overlooked by hospital administrators and architects. It seems customary to plan the rest of the hospital without much thought toward food storage and then end up by locating the store room in any space that cannot be used for any other purpose. The purchase of food unquestionable involves the expenditure of more money annually than any other phase of hospital service. Even though food may be considered one of the things that keeps the hospitals going, we must emphasize the importance of good food and how essential it is to the hospital. Space set aside for food storage should be well lighted, well ventilated, and should be equipped with screens and tight fitting doors to prohibit the entrance of insects and rodents. This room should be in such a location that it is not subject to flooding. Containers should be provided, preferably of the metal type, for the storage of such items as cereals, crackers, coffee,

flour, and any other food which may be purchased in quantity. We do not have to emphasize the fact that insects and rodents prefer to eat the same food which we consume and if we do not protect that food from such pests, contamination will ultimately occur.

It would be impossible for me to tell you the size of refrigerator that you should have in your hospital. The important thing is that the refrigeration facilities be large enough to accommodate the hospital's needs. The best way to determine this item comes as a result of years of experience in your hospital. There is some disagreement as to the temperature which should be maintained in the refrigerator. This Department prefers that a temperature of at least 45° F. be maintained, although a maximum of 50° F. is not too objectionable for short periods. I might also mention that it is impossible to determine the temperature in the refrigerator unless a thermometer is provided. In Dr. Sauer's talk this morning, he mentioned that if milk is properly sterilized, it can be left at room temperature almost indefinitely with no indication of spoilage. Theoretically, I believe he is right, although actually, I certainly would not recommend that you discard your refrigerators and permit the storage of milk or other food products at room temperature. We should not only stick to refrigeration, but we should plan for the time when our hospitals can be equipped with more refrigerators. Consideration should be given toward the location of the refrigerator in the maternity department. Instead of placing the refrigerator in the utility room along with service sinks, bed pan washers, and so forth, let us plan to place it in a formula room set aside for the specific purpose of formula preparation. This matter of refrigerator location is another item which cannot be governed by one rule, but rather must be worked out for each hospital so that the facilities provided can be so located to eliminate unnecessary traffic through undesirable portions of the hospital. Another item with regard to refrigeration, particularly concerning the walk-in refrigerators, is one of proper location of the food in the unit. A walk-in box that utilizes the floor for storage is considered too small. Although it is common practice to place many vegetables on the floor of the refrigerator this is not acceptable because many of those vegetables such as carrots, lettuce, radishes, etc., will be consumed in the raw state and if they become contaminated while in the refrigerator, this contamination is not removed before the food goes to the patient. The most common defect in walk-in type refrigerators is the provision of a floor drain which only serves to permit surcharge of sewage back into the unit to contaminate the food which may be placed on the floor. I should also mention at this time that small containers of food should be covered, even though the cover is nothing more than a plate or saucer.

With regard to food handling procedures, there is much that can be said about this item. First of all, perhaps the most important consideration should be that food handlers should be free of all types of communicable diseases. Kitchen personnel should have a clean appearance, should wear clean clothes, and should keep their hands clean. A cap or some sort of a fine meshed hair-net should be worn on the head. There is nothing more disturbing than to see a girl working in the kitchen with her hair half way down her back. Dr Newberger mentioned in his paper that there were certain "musts" on plumbing fixtures such as handwashing facilities in nurseries, etc. I should like to emphasize at this time that there should also be handwashing facilities in the kitchen which are suitably located so as to be accessible to all persons working in food preparation. I realize that there has been much argument about this extra item because of the thought that the vegetable preparation sink, for instance, can be used

for cleansing the hands. This sink is for the exclusive use of vegetable preparation and is not to be used by employees for washing their hands. The kitchen should be kept scrupulously clean at all times. A hospital administrator should be so proud of his kitchen that he would not hesitate to have all persons entering the hospital go through that part of the building. Outside persons who might see the kitchen, should have an immediate desire to share a meal with you there, instead of being impressed with the filthy condition in which the kitchen is being maintained. Even though I realize that much more could be said about the kitchen, let me conclude this portion by saying that extreme care should be given to the washing of dishes and pots and pans. Personnel employed to do this task usually have a rather low I.Q. Employers frequently are of the opinion that this particular task is one that can be performed by anyone, but on the contrary, the people employed in this phase of kitchen work should be carefully selected individuals and should be taught the proper methods of carrying out their duties.

The disposal of rubbish and garbage from a hospital is very important. All garbage and rubbish should be stored in clean metal containers having tight fitting lids. Disposal should be accomplished at frequent intervals in order to maintain the proper sanitary standards around the garbage platform. Disposal may be by private scavenger, municipal collection, or by incineration. Closely akin to garbage and rubbish disposal is the matter of sewage disposal. This does not present too great a problem for the hospital because most of such institutions in Illinois are located in cities which have an adequate sewage collection system.

Now, let us go from the undesirable subterranean kitchen to more desirable places elsewhere in the hospital, let us consider the item of general cleanliness. Janitors or maids usually perform this service and as a rule are fairly competent. General cleanliness includes such items as the cleaning of floors, the maintenance of floors and walls, and the washing and disinfection of many pieces of equipment and fixtures. A dry mop to clean the floor does little more than to stir up the dust and dirt which are present. The best method of cleaning floors is by the use of a wet mop, either with warm or cool water and lots of elbow grease. Oiled mops are considered reasonably satisfactory, although if not properly cared for, they will serve the same purpose as a dry mop. Walls and ceilings should be maintained so as to free from cracks or loose plaster. These should be covered with a good grade of washable paint so that they can be washed at frequent intervals. Curtains and rugs make a nice appearance in a hospital, but their use is discouraged because they cannot be kept clean. There are many pieces of equipment which require frequent washing and perhaps disinfection. This should be accomplished right along with the cleaning or may be set up in a separate work schedule to be performed at other times. I am wondering if perhaps nurses and maids do not overlook the fact that many pieces of equipment such as door knobs, cabinet handles, and perhaps the flushing arrangement on the bed pan washers become grossly contaminated in their use. No doubt many times a day contaminated hands touch these various fixtures only to be followed by a person whose hands are considered clean. This is one possibility for the transferral of organisms from one person to another.

During the last few years, much consideration has been given to the matter of airborne infections. We know that over-crowding, whether it be of the mothers' or infants' is hazardous and encourages the transferral of organisms from one

individual to the other through the atmosphere. I shudder to think of the number of times that I have seen two mothers in a room that was scarcely large enough to accommodate one bed, or have seen one or more patients located in the corridor where they are subject to exposure from all types of organisms. I realize that these conditions occur as a result of overcrowding of the present hospital facilities. Frequently I have noticed that racks have been used in the nursery with 6 or 7 cribs being accommodated. This causes one infant to be located immediately adjacent to another which is just as dangerous if not more so than crowding two mothers in one small room. Dr Newberger has pointed out that we prefer to have between 18 inches and 24 inches between any two bassinets. The Army Air Forces have done a lot of work in an effort to decrease the number of air-borne organisms. Their work concerned itself primarily with the oil treatment of wool blankets to cause the dust to adhere to the blanket. Their results were not too encouraging in that the storage of such blankets over a long period of time caused them to become rancid. Just recently, however, more research has been done along these lines and it has been found that if the correct emulsion is used, a slight film of oil can be left on the blanket or on the linen in such a way that it is not noticeable to the touch, it does not present a greasy appearance and it does control the most of the dust particles that otherwise may be present in the air. There is some disagreement among authors as to whether or not the organisms adhere to the oil treated blanket or whether they are repelled, but it is pretty well agreed that there are less bacterial organisms in the air where such blankets were used.

Before leaving this subject of air-borne infection, I believe it would be well to make a few remarks about the use of germicidal lamps. In the last few years, many hospitals have spent thousands of dollars in the installation of such lamps and in too many cases the hospitals have been misled to believe that these lamps are cure-alls. I have personally been informed by nurses in hospitals that they have been advised by the company installing the equipment that with the use of the lamp, certain time consuming and monotonous techniques can be skipped. I cannot too strongly emphasize that this is not true. Dr. Sauer mentioned this morning that they have been found to be of no value in the control of diarrhea of the newborn. Just what good can be accomplished with these lamps in the control of organisms causing respiratory infections we cannot say. The last few months have brought forth many reports of research on the effect of germicidal lamps. These reports vary so widely in their results that after you have read a few of them, you begin to wonder just what can be accomplished by these lamps. Frequently, manufacturers of lamps will give you the results of their own tests, but it has been my experience that many concerns give you only the information they want you to have. In my own mind, it is questionable whether germicidal lamps accomplish exactly what you want them to accomplish. This Department will not offer any objection to the installation of a germicidal lamp although we do not require that they be used. If a hospital is considering such an installation, we advise them to deal with a reputable concern in order to get the best product available and above all that it uses the lamp as a supplement to good nursing technique. Another item which all hospitals should know is that the majority of lamps will burn for many hours more than they will give off germicidal rays. As an example, a lamp might give off light for a period of 9,000 hours but would produce germicidal rays only for 3,000 hours. The manufacturer of the equipment recommends that the lamp be replaced after so many hours, even though it may still continue to produce light. Again let

me state that the germicidal lamp mounted on the wall or suspended from the ceiling is not intended to cover up mistakes or omissions which may be made. Their use will not permit you to overcrowd your nursery. An honest manufacturer of this equipment will confirm this remark.

The next topic of discussion is one which perhaps all of you are less familiar with than other phases of hospital sanitation. I refer specifically to plumbing. All of you are acquainted with fixtures such as lavatories, bath tubs, toilets, sterilizing equipment, etc. but the majority of hospital personnel think of plumbing only as the fixtures which they use and not as what actually may take place in those systems. First, let us visualize any fixture with its safe water supply and sewer connections. The water supply pipes furnish a safe water to the fixture and the sewer or drain pipes carry away the waste water or contamination from the fixture. The two sets of pipes must not become connected in any manner and we must make certain that it is impossible for the material inside the sewer pipe to get back into the inside of the water pipe. If this should occur, some person may use the water supply and not be aware that the water is unsafe. I wonder if you realize that probably 95% of our hospitals today in Illinois have installations of one type or another than can permit the mixing of human waste material with their drinking water supply. I might mention that this condition permitting the mixture of the two materials is commonly referred to as back siphonage. I am sure that you have at some time or other noticed a fluctuation in the water pressure from various faucets at various times of the day. It is perfectly normal for the fluctuation to occur, due to changing demands for varying quantities of water. If the pressure in the water pipes should drop the point where it is zero or even go beyond that point which is a vacuum, then we have a perfect set-up for this intermingling of sewage with safe water. I have seen many fixtures which, if such conditions should exist, can permit this dangerous thing to happen. I might add at this time that sterilizing equipment is no exception. We must then insist that the various fixtures are so designed or are so installed that we can prevent the occurrence of back siphonage. We can do this by installing the proper type of faucets on such fixtures as lavatories, bath tubs, and sinks and by installing devices known as vacuum breakers on other fixtures such as toilets, x-ray developing tanks, service sinks, etc. The remodeling of sterilizing equipment presents a little different problem, although the necessary changes can be made to assure satisfactory protection and operation at little expense. The sterilizing equipment as you buy it today is generally satisfactory, although there are still some mistakes which can be made when this equipment is installed.

So far as insects and rodents are concerned, most hospitals are bothered only with flies and cockroaches. As pointed out previously, these pests have been known to contaminate and destroy food and in many instances have been identified as carriers of certain types of disease. It hardly seems necessary for me to tell you that screens on windows and doors are important, although I find quite a few institutions which are not equipped with them. Many flies, mosquitoes and similar insects can be kept out of the hospital by proper screening. Cockroaches gain entrance to the hospital mostly through packaged goods, such as boxes of fruit and vegetables, therefore we must be constantly on the alert to destroy them after they have entered the hospital. One of the most important ways of keeping the roach population at a minimum is by maintaining a clean kitchen. Up until the last year or two, the most common way of destroying roaches was by poisoning them with a chemical known as sodium fluoride. This material, of course, will kill roaches but it is also toxic

to man and, therefore must be used very cautiously. Sodium fluoride in its true form is a white powder which resembles flour, corn starch and similar materials but to avoid using this poisonous material for flour or starch, most chemical producers now color it a robin-egg blue. If you should use this material in your hospital, be sure to make certain that you use the tinted material. World War II introduced to us a new material which is quite effective in controlling various insects. This is known as DDT. When purchasing DDT in spray form, you should be certain that it is of at least a 5% strength. Some fly sprays do not contain any DDT and others contain only a fraction of 1%. This material is sprayed directly onto the walls and ceiling in your kitchen as well as on the window frames, window screens, and door screens of the building. As it dries, it leaves a slight, unnoticeable film of DDT chemical on the surface. This film has a toxic effect for several weeks which is referred to as the residual effect.

The effect DDT might have on a person who ate a small portion of it has not yet been determined and until we know more accurately what the toxicity is, we warn you to use the material with caution and be careful that dishes, food stuffs and cooking utensils are not contaminated with this material. Rat control does not seem to be a major problem in most hospitals. If you are confronted with rat infestation in your institution, we briefly recommend that the building be checked in order to eliminate any possible avenues of entrance and for those rats that may find their way inside the building it is best to poison or trap them. If poison is used the person placing it should understand thoroughly the capabilities of the poison and the toxicity of the various types toward man. Perhaps the most common and safest material is known as Red Squill. Antu and 1080 are other very efficient rat poisons but must be used only by a person thoroughly familiar with their dangers.

I realize that I have not told you all of the details which are involved in the sanitation standards constituting a part of our maternity hospital program. I have attempted to cover in a brief way the most important features and it is sincerely hoped that hospital administrators experiencing other problems in sanitation are not hesitant to share them with the State Department of Public Health in order that we may give you the benefit of our experience in handling those individual problems.

In conclusion, I should like to point out that hospitals which are planning new additions or are contemplating the erection of a new building should have their architect consult with the staff of the Division of Maternal and Child Hygiene in Springfield prior to the time the building is constructed. It has frequently been found beneficial to have the architect as well as the superintendent or administrator confer with that office to discuss the various standards involved in the project. I need not emphasize to you that it is much easier and much less expensive to make changes on a blue print than to change the location of a wall or a sewer line or even tear out certain plumbing fixtures and replace them with approved equipment after construction is completed. According to the interpretation of the maternity hospital act, the plans and specifications for any work which involves the maternity department or any construction which deals with other sections of the hospital which might effect the maternity department must be sent to the Illinois Department of Public Health for review and approval prior to actual construction. This procedure has shown some very favorable results in that when the construction is completed, you are assured that it will not be necessary to relocate certain units or replace certain fixtures which might not be satisfactory.

Dr Herbolsheimer: The foregoing speakers have given you an outline of the details of the responsibility which the Health Department must assume through the Maternity Licensing Law. If all of these procedures were carried out--the constructural details, the nursing technics--we should have a perfect plant and the best of hospital services would be available for medical care.

Notwithstanding repeated inspections of hospitals we have had eleven epidemics and I know that you have come for the answers as to how you can prevent the occurrence of this disease. Among the many reports in vast literature on epidemic diarrhea of the newborn I do not recall any given by an administrator of a hospital. I know that the worry we feel in Springfield is exceeded by the anxiety experienced by the person who is responsible for the administration of the hospital. Sister Justine has consented to appear with us to start specific discussion on control of epidemics, reviewing her experiences in Alton. Sister Justine.

THE PHILOSOPHY OF HOSPITAL ADMINISTRATION
AS IT RELATES TO CONTROL OF
COMMUNICABLE DISEASES IN INSTITUTIONS

by

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When Dr Herbolsheimer asked me if I would take part in this program she gave me for my topic, "The Philosophy of Hospital Administration as It Relates to Control of Communicable Diseases in Institutions". Immediately there came to my mind the countless articles about what hospital administrators should be and shouldn't be and what the hospital administrator should do and shouldn't do that I have almost reached the decision that a hospital administrator should almost be an angel.

A constant threat to the hospital is diarrhea in the newborn. Our recent experience with a serious epidemic was, in all my years in hospital work, my first experience in what we call epidemic diarrhea of the newborn. Before becoming a hospital administrator, I had charge of an obstetric division and I had no experience whatsoever with diarrhea; so the practice and the theory is entirely different. You may sit down and read articles of what to do and what not to do but when it really comes home, it is an entirely different affair.

I have not prepared a paper on this because, frankly, I am still pretty tired. We've opened our nursery on July 2 and I think that all personnel in the obstetric department are almost ready to step out. In fact, I think they are tired of the strain; we know that newborn babies, whether full term or premature, or congenitally deformed, are being cared for in our obstetric nursery. I am up there all the time asking questions and interviewing. In addition to this our nurseries are often understaffed, the nursing personnel is often untrained and unacquainted with the details of aseptic nursing technics. The babies are constantly being taken to the mothers' rooms for nursing. Added to these we have the constant dressing, diapering, bathing, and administration of treatment to

our babies. Facilities in the hospital are always lacking for segregated care for premature or infected babies. Newborn infants, if small, have an acute susceptibility to infection and when an infection breaks out in a nursery it passes from one infant to another with remarkable rapidity.

I am going to tell what we did in Alton. When it first came to our attention and we decided what we had, we immediately closed the department, and then we phoned the Health Department. I did not know at that time that this was going to be such a serious matter. I met the expectant mothers coming and told them very plainly what we had. They did not seem to realize the seriousness of this. I told them that our babies were dying and that it would be a great risk for them to remain in the hospital and that we were referring them to another hospital. Right now we want to say what a debt of gratitude we owe to the Memorial Hospital in Alton. You realize that it is no small task to close a department in a hospital for the duration of the illness and have the doctors release the patients to their homes or to another hospital. Then you have to bring in painters working day and night to paint that department. Meanwhile you have to handle the flow of obstetric cases. That is what the Alton Memorial Hospital did. Our doctors showed a marvelous spirit of cooperation. If there is any gratification in such a thing it was a gratification to see how our doctors and hospitals all acted as one. They sympathized with us and they stood by us. The administrator of the Alton Memorial Hospital, Miss Jane Graves, and her nursing staff, put themselves out to help us. Our doctors sent their patients home from 4 to 5 days after delivery and then they employed a nurse giving her a very splendid salary to visit mothers and newborn babies in their homes until we had our department open again. I want to take this opportunity to thank our doctors and hospital administrators in Alton for their splendid cooperation with us. When we realized it was diarrhea we removed the babies who had just been born that day or the day before and improvised a nursery in one of the patient rooms. We put the babies in new bassinets which had never been used. We used new mattresses and new linen and we put in different nursing personnel who had not been in contact with other babies. We thought we could save some of the babies. Some we did; others we didn't.

Strange to say, the day we closed our department I made the rounds visiting mothers and told them. Some of our babies had been taken to the mothers. They did not notice any difference in the babies. When I told them that we thought they had diarrhea and not to be alarmed they did not believe it and insisted there was "nothing wrong with my baby who just came to me". Nevertheless we impressed upon them that it was serious. It proved to be, but regardless of what we did, some of the babies died.

In going over this epidemic it seems to me that first of all the important thing is to have efficient well-trained pediatric nurses, if they can be secured. Secondly, early recognition of the symptoms, third, immediate reporting of suspect infants to the Department of Health; fourth, the immediate segregation of the first infected infant (and I am going to ask the pediatric consultant to tell you what we did with the first infant); fifth, closing of obstetric service in the newborn nursery to new patients on the slightest suspicion of diarrhea. I am willing to say if I thought for one moment we had one case I would close the department again. I would not want to experience that same thing again--isolation and quarantine of all sick infants, close observation of all infants exposed, and follow-up of all infants recently discharged are

both the physician's responsibility and the hospital's responsibility. Readmission to the same hospital of babies, found ill, (if they have not already been admitted to another hospital).

When we closed our obstetric department we did not know at the time how it was going to affect the older children. I was thoroughly frightened, and I still am, but we closed our pediatric department at the same time we closed our obstetric department. I wish to express my deepest appreciation and my gratitude to the Illinois Department of Public Health. They were wonderful in their cooperation and their suggestions of what we should do. We really and truly tried to carry them out. Previous to this epidemic we had washed the mothers' hands with 70% alcohol prior to bringing the baby to her for nursing. Now we have changed to washing the mothers' hands with soap and water. We have instructed the mothers not to touch anything after washing their hands with soap and water. We have tried to bring in nurses' aides. Sometimes they are difficult to get.

I realize that the task of control is large. If any of you hospital administrators have not experienced epidemic diarrhea I hope you never will. That is the reason why we are following carefully every recommendation the State Health Department has given us. So far everything is splendid. Another thing we are doing is interviewing the mothers; asking them if in 2 weeks previous to admission to the hospital they have had diarrhea or sore throats and then we take their temperature. If they have had a rise in temperature we do not take them to the obstetric department. We have had 3 or 4 cases we have not taken to our obstetric department. I have followed very closely with interest the speakers of this morning and if it is not necessary to interview our mothers then the logical conclusion is that the diarrhea is brought in by our nursing personnel or doctors. If it is brought in, then the interviewing of mothers will continue. I would like to ask you people what you think. After all--technic is a means to an end; which is proper care of our newborn infants. Technics cannot become so complicated that the means becomes the end, but we must send newborn infants home as well infants.

Dr Herbolzheimer: Sister Justine, I am very grateful for the complete picture of what was done in the Alton situation. The gratitude which Sister Justine described is a measure of the Health Department's own gratitude for the hospital's handling of the epidemic in Alton. This discussion and those to follow point up the questions which we are looking to people like Dr Sauer and Dr Watt to answer.

Sister Justine: Our nurses donned gowns over their own uniforms. We have now eliminated that. We have a room where they take off their uniforms and they don what we call our nursery gown which we have made especially for the nursery as a short sleeved gown. Our pediatricians go up to surgery and scrub up and when they step into our examining room we have a sterile gown for them. Those are the things we are trying and I hope it isn't useless.

Dr Herbolzheimer: To follow Sister Justine's discussion of the recent epidemic I would like to call on Dr Humphrey, the pediatrician in Alton, to review the situation from physician's side.

Dr Humphrey: This is entirely spontaneous. First of all I should like to say that this epidemic in Alton was confined to one institution. I do not believe

that it was carried by hands. I would like to mention that the onset was entirely explosive. It was spontaneous, it was severe. This thing struck with lightning speed. Even the prematures; and the prematures died. As far as records in the hospital indicate there has never been a previous instance of epidemic diarrhea. I have seen none in 6 years or so. The technics in the hospital are good. I am inclined to believe they are as good as you can see in any institution in a large city.

This epidemic was distinctive in its characterization from beginning to end. First of all we were shocked by the rapidity with which it spread. These prematures were not in the open nursery; they were in incubators, where special technics prevailed, and they were first to become ill. In less than 36 hours the disease spread to the other nursery. A little while, one or two weeks after those prematures were affected we heard talk in the community about diarrhea in infants at home. I saw many of them and put them in the pediatrics department. After a few days the disease increased in its intensity. The babies became increasingly sick. We saved some but many did not respond to heroic treatment. The hospital closed the obstetric department after one baby was delivered at 11 o'clock at night. It took that baby 36 hours to develop symptoms and it lived just 48 hours.

As the epidemic increased and the infecting agent was passed it increased in virulence. Babies became increasingly ill very quickly. Two or three cases popped up, maybe the child had a little otitis media. These children did not die because they were dehydrated, they didn't get that far. These children became toxic, ashen gray and had many stools.

Now why do we feel that it was distinctive? Primarily because one important factor struck me; these children showed very definite cerebral symptoms. Very many had convulsions. We did autopsies on a few of them and many children had hemorrhages in the brain. We felt that this was an acute virus infection. Certainly it was severe enough to make us feel that it was strictly a localized thing and the pathologists in the community could find no similar experience. One other point I would like to mention: epidemic diarrhea of newborn is often stated to be strictly in the nursery. This epidemic was not strictly in the nursery. We had children 3 weeks to 6 months old; they got diarrhea and died. Children 18 months up to 2 years had the same thing.

On the infants in the nursery we did blood counts, blood cultures, gave them penicillin, blood plasma. Some of them got well.

Some people said maybe we acquired the disease from those coming back from England or France. I spoke to one English woman who said she had diarrhea coming over on the boat. The epidemiology of this disease is a difficult point to settle, and we cannot be too sure as to the significance of these reports of transmission to this country from foreign lands.

Of our experience in Alton I should like to say in summary that I feel that we were dealing with a disease so severe that should it occur in any of the institutions in the country, they would in all probability have the same high mortality rate.

Dr Herbolzheimer: Dr Humphrey, we are really grateful to you for this fine extemporaneous discussion. I appreciate your willingness to participate on a

last minute invitation and I am sure that if we had not the printed programs we would assume from the excellent discourse that Dr Humphrey was one of the speakers scheduled in advance. Perhaps we can look to Dr Shaughnessy for some of the answers to questions raised by Dr Humphrey. Dr Shaughnessy is, as you may know, the Chief of the Division of Laboratories of the State Health Department. Dr Shaughnessy.

RELATION OF THE LABORATORY OF THE STATE HEALTH DEPARTMENT
IN PREVENTION AND CONTROL OF EPIDEMIC DIARRHEA

by

H. J. Shaughnessy, Ph. D.
Division of Laboratories
Illinois Department of Public Health

One of the penalties of being the last speaker on a long program of this kind is that almost everything of what I planned to say has already been said. On the other hand being the last speaker has certain compensations. One is, it is possible to look over what the others said and try to build upon that and fill in some of the gaps. I particularly like the analogy Dr Watt drew of diarrhea of newborn and the diarrhea that calves are so apt to have. This disease of calves known as scours has been studied for many years. Smith showed many years ago that common *B. coli* could cause it. I have no doubt that a variety of other organisms could do so. He also showed that immunity of calf had a great deal to do with it. If the calf was not allowed to suckle early so that it got the colostrum (which is the principal transmittal of immunity in these animals) they were more apt to suffer from scours. Newborn infants have to depend upon their mothers for immunity against parasites which they encounter in the world. They have very little immunity except that passed on by the mother through the placenta. It doesn't require a great deal of imagination therefore to conceive that they may not have immunity against a great variety of parasites capable of causing diarrhea of the newborn. In other words it may not require a specific parasite to cause this clinical picture called epidemic diarrhea of the newborn but it may be caused by almost any organism. Because of that we attempt to follow out our responsibilities in Division of Laboratories by sending help to hospital laboratories. In the average hospital laboratory, even the larger hospital laboratory, enteric disease work is apt to be neglected for the very good reason that hospitals are not commonly called on to carry out bacteriological work on stool specimens. For the same reason practically none of the hospitals with the exception of a few teaching hospitals do any virus work at the present time. Since this disease involves study of the enteric pathogens on one hand and possible virus agents on the other it is reasonable to expect that hospitals do need help in carrying on the practical work of deciding what agent is involved in a particular outbreak.

We are prepared to send bacteriologists into the field if requested to do so. But, as emphasized by Dr Watt, we can't say that we will find anything of value in any specific outbreak. It must be re-emphasized that we are looking for any pathogen which may be involved, and since the usual pathogens have ordinarily not been encountered in this disease there may be some delay in detecting some of these other organisms which may be acting as pathogens in this outbreak. Looking for the unknown makes it more difficult for the laboratory than if we were looking for a known organism such as the typhoid bacillus. Over the past few years quite a number of outbreaks have been

investigated and in no instance have we found any of the commonly accepted enteric pathogens. Now that doesn't mean they are not there. Dr Watt stressed the fact that we are dealing with entirely different type of specimens when we are dealing with the stools of infants. It may be that our technic is not adequate for their detection. We are inclined to think that it is, but we may be wrong. I certainly feel that the approach that Dr Watt has outlined of finding norms for the bacteriology of infants so we can detect deviation from those norms is a sound procedure.

We have found some organisms associated with some of the cases in these outbreaks. In an outbreak that occurred last spring in Bloomington it was noticed by Dr Cline that the infants affected by this disease had abnormally red mucous membranes of the nose and throat and on that account cultures were made. An unusually high percentage of these infants showed green producing streptococci. If we had found streptococci and staphylococci in older children we would have paid no attention because those organisms are commonly found in normal noses and throats. However, the literature shows almost nothing in regard to the normal bacterial flora of nose and throats of newborn infants. I have written to numerous authorities who have studied this problem and they state nothing has been done to determine norms of this kind in young infants. What we thought was a control group was studied in Bloomington and it was found the incidence of green streptococci in these was just as high as in the nursery with the epidemic. But it turned out later through investigations of Dr Cline that there was also diarrhea in that institution so we really were not dealing with a control group. Since that date Dr Cline has told me that Dr Parker Dooley of the University of Chicago has run studies on a group of 100 newborn infants and has not found these particular organisms in their noses and throats. I merely cite this individual experience to show that we are looking for something without knowing exactly what we are looking for because we do not know what the norm is.

I would like also to emphasize that even if we find Salmonella and Shigella we keep in mind transient carriers do occur. In the mental institutions we have found a great many newly admitted patients harbor Salmonella but without showing any symptoms whatever and rid themselves of these organisms within a short time. We are thus in the throes of dilemma. We don't know where we are; if we do find certain bacteria, we do not know how to interpret the finding. So much for the practical side of it.

From the research standpoint we are also carrying on studies because we think that this disease is important enough so that almost everything else we are doing should be laid aside when outbreaks occur. We are therefore willing to devote a considerable amount of time and energy to the study of these outbreaks of epidemic diarrhea in the newborn. It has already been stressed by previous speakers that almost every bacteriologic agent that is known has been implicated at one time or another. In the research studies that we have made of all epidemics brought to our attention we have found no unusual bacteria with the single exception of the green producing streptococci mentioned above. Their significance is not fully known. We must look for them in other outbreaks and determine their relationship to the disease.

This leaves for discussion the group of disease agents among which I think we have the greatest possibility of finding the cause of this disease, namely,

the viruses. Light and Hodes called attention some four years ago to the virus they had isolated as a possible cause of this disease. Some aspects of their work look very good. However, calves were used in their studies and as Dr. Watt said this morning, calves develop diarrhea from so many causes other than the inoculation of specimens from suspected cases of this disease, that one would be inclined to be conservative in drawing conclusions from studies on these animals. I have been told, on the other hand, that studies have been made in the University of Michigan, Department of Bacteriology, with material provided by Light and Hodes in which they have shown that calves inoculated with this material developed severe diarrhea which could be transmitted through several generations. Just the other day I learned that investigators in the Michigan Department of Health Laboratories have isolated what they believe to be the causative agent. This work was done on calves and it was stated that their greatest difficulty was in carrying it from generation to generation in these animals. Our experience with calves is that they are one of the poorest experimental animals we have ever used. They are expensive, they are hard to maintain and they have spontaneous diarrhea. In a limited amount of work with these animals, we were unable to get any results, but this does not mean, of course, that the work of Light and Hodes is not true and that it may not be confirmed by others.

More recently, another virus has been described by Buddingh at the Vanderbilt University, as the possible cause of diarrhea of the newborn. This particular virus was described as capable of causing stomatitis in older infants and in adults and diarrhea in young infants. It was stated that most premature infants showed almost no stomatitis, but definite diarrhea. Older infants showed both stomatitis and diarrhea. Adults rarely, if ever, showed diarrhea but did have stomatitis. It has been stressed by subsequent workers that stomatitis may be very mild and could easily be overlooked. There may be a slight eruption on the tip of the tongue and underneath the tongue and around the lips. This virus has been isolated and transferred through serial passages in the eyes of young rabbits but its discoverers have been unable to get it to grow in chick embryo and have also been unsuccessful in infecting other animals with it.

One thing in this work that interested me especially, is that the virus was isolated from the birth canal of a mother whose infant developed diarrhea of the newborn on the fourth day after birth. The virus has also been isolated from the male urethra in one case and from intestinal contents and from swabs of the mouths and throats of infants. Buddingh himself apparently became infected during the course of his work with this virus and developed a stomatitis but no diarrhea. This work was published too recently for us to learn about it and attempt to confirm it.

Since we became interested in this disease about five years ago, we have looked for a virus in the material from all outbreaks that have come to our attention early enough so that such studies were warranted. In specimens from the outbreak that occurred three years ago in Waukegan, an agent was isolated that seems without doubt to have been a virus. This agent was isolated from the blood of the newborn infants and also from the blood of their mothers and one of the nurses in the maternity ward. Guinea pigs inoculated with this material developed severe diarrhea and lost about one-third of their body weight within a very few hours. We were able to transmit this through several generations in guinea pigs but the agent became weaker on each passage and was finally lost through an accident after four transfers through guinea pigs.

It seemed at the time that the results were so conclusive that they could be repeated with no great difficulty. We felt that the reason for success was that we had attempted to find the virus in the blood rather than in the feces as every one else did. However, since that time a large number of guinea pigs have been inoculated with materials from outbreaks and we have not yet seen the same clear-cut picture in a single guinea pig since then. As far as we are concerned, therefore, we are apparently as far away from any conclusive proof of the virus etiology of this disease as we ever were.

So much for the responsibility of the State Health Department in connection with maternity hospitals. I hope it won't be presumptuous to say that it is also the responsibility of the maternity hospital to aid this Department as far as laboratory studies are concerned. It is obvious that we cannot do any work either toward practical control or toward discovering the etiological agent if we don't have cooperation from the hospital. We need to learn of these outbreaks just as soon as they start. In almost every outbreak we have learned of the existence of cases of diarrhea of the newborn when the outbreak was virtually over. It was therefore impossible to get the material. We would especially like to have postmortem material which seems to us the most likely to contain the agent. Yet in several instances where deaths have occurred we were unable to get any material of this kind. I might say that other groups of investigators have asked us to obtain postmortem material for them and we would like to cooperate with them also. There is certainly room enough in this field for any number of investigators.

Dr Herbolsheimer: Thank you, Dr Shaughnessy. I would like to turn the meeting back to Dr Boyd for the discussion period.

Dr Boyd: It is obvious that there is a great deal of interest and considerable points to discuss.

Dr Watt: First question I would like to bring up is not entirely a question. I would like to point out that in diarrhea of the newborn the responsibility is quite a problem. The State of Illinois is to be congratulated on the amount of diarrhea in the newborn that they are so concerned about today. That sounds queer but if you look into it, the better the Health Department, the more likely the concern for diarrhea of newborn. As a Health Department, through improved services, cuts down the amount of diarrhea from other causes you have these cases assuming a larger and larger importance in the figures of infant mortality. People do not pay much attention to prematures and newborn infants. They are too new in the world. You find they are most interested in older people. So I think the concern which is shown here is a compliment.

The other question which I wanted to ask was the point about the regulations. I think it is extremely important in formulating regulations to be certain that you do not write regulations that you cannot enforce. It seems that the regulations that have been drawn up by the Health Department are rather unenforceable. I should hate to see regulations put down as law that would be impossible for you to meet. I should like to see less regulations, regulations that could be amended as you go on, than those you can't meet. I question the value of interviewing mothers on admission as to whether they have had diarrhea within the past week. I don't know whether you are accomplishing anything by it. As I said this morning the shigella is 20 to 1 a carrier. Negative answers received to questions give a false sense of security. All of these regulations become unnecessary if you develop a technic to make each baby and

each mother an individual case. Keep the infection that you believe is there from spreading from one child to another. I would like to hear discussion on that.

Doctor Cline: I too would like to agree with Dr Watt that Dr Herbolsheimer and her staff should be congratulated. I made a big effort to get here and I wouldn't miss this meeting for anything. These problems are facing us in our own communities. We didn't have full cooperation in our epidemic (Bloomington). The physicians weren't quite so happy and helpful in some instances as I wished they were. I made trips; Dr Shaughnessy sent help from Chicago; we met trains. Dr Newberger came down. The thing that is interesting to me is I think we did have a different type of epidemic, we had a definite clinical entity in our epidemic. In all cases we had an upper respiratory infection. Many of the families had upper respiratory infections. I disagree with Dr Watt about the value of questioning mothers on admission. Before our epidemic we didn't question our mothers. You have to question the mothers. We didn't. One mother swore up and down she was well. We took her up and started to give her an enema and she said she didn't need it--she had had diarrhea. Our people got sick, I got sick with diarrhea, sore throat. Nine of us one day. I went out in the homes when we had 54 sick. We did have streptococcus. Our nurses showed green strep. We had one baby which weighed 3 lbs who had diarrhea, had virus pneumonia, then he had a heart disease--couldn't see how he could live, then he had jaundice. He had 25 stools a day. The baby died. I had 33 neonatal infants in my practice with diarrhea; there were 5 deaths in our group. I gave penicillin, sulfa. Sending the babies home on the third day saved us further losses. When there is trouble close the nursery and discharge patients soon. As Dr Sauer said we must give up our big nurseries; we must admit that we are in trouble when diarrhea starts and we must get help immediately. Through cooperation I think we can save babies' lives.

Dr Newberger: I think the question of regulations raised by Dr Watt is important. I believe it would be a serious thing for hospital administrators to leave this conference with an improper impression. I agree nothing should be included in regulations that is impractical. Our regulations, in our opinion, are practical and can be carried out. We take this position after 6 years of experience in the field, seeing what is going on and talking to hospital administrators. I think it is interesting to note Dr Sauer's statement "what if it does cost a little more". This matter of questioning patients on admission, I believe is not a difficult thing to do; we should be able to recognize the obvious cases. I feel that the hospital ought to know what state of health the patient is in; if she has acute infection not to forbid her hospitalization but she should have a little different care. We have again and again been in hospitals where facilities have been substandard and we have succeeded in getting them raised. With a little patience, a little effort, such hospitals came around to fulfilling the requirements that we asked of them. Regulations can be of value.

Dr Watt: About the question of regulations, my feeling is that questioning and examining cannot be relied on. We know that by examining of prostitutes we cannot have a regulated group of prostitutes. I maintain that every mother that comes into a hospital and every child admitted to the hospital is a potential suspect. Make your technics apply equally to all of them not just those that are believed to be infected.

Dr Herbolsheimer: In the middle west we have many things that are peculiarly middlewestern. Many of our procedures in obstetrics and neonatal care that seem to make us peculiarly outstanding stem from the teachings of the late

Doctor DeLee. Some of these teachings came out of a past that was not brightened with the understanding of bacteriology and epidemiology that we have today. Many of these procedures and technics evolve empirically. Be that as it may, the results of such procedures are reflected in the outstanding statistics of the Chicago Maternity Center and the Chicago Lying-In Hospital. I am not prepared to say that some of the technics are necessary or unnecessary, but we must all realize that they are a precedent of long standing and that they are re-enforced with such good results that it takes great courage and firm conviction to deviate from those practices. Many of you are doubtless quite familiar with the Chicago Lying-In Hospital architecture which separates in two distinct buildings the normal from the septic cases, both mothers and babies or either one or the other. We are all familiar with the fact that in communicable disease hospitals cases of different diseases are given care side by side in open wards without cross infection. In these communicable disease hospitals, however, the highest of skilled isolation nursing technics prevail.

I can quite readily see Dr Watt's point that it is impossible by questioning or by casual examination to determine whether or not a patient is a carrier of a communicable disease. I heartily agree with him that the ideal procedure would be the knowledge that in every institution every patient was given care on an individual isolation technic basis rather than a general departmental nursing service. It is nevertheless especially difficult to throw out precedent in the care of obstetric patients.

With regard to the regulation requiring nose and throat cultures on personnel giving care in the obstetric department, this is another exaction of obstetric services that has its root in extensive practice. The other day I questioned the administration of the Chicago Lying-In Hospital about their record on ten years experience with nose and throat cultures on nursing and medical personnel. In the first place I asked why the cultures were done and with what periodicity and asked for any correlation studies on the incidence of infection in personnel and the incidence of infection in patients. I was rather disappointed at the fact that the whole procedure had not merited sufficient study after years and years of application to determine whether it was a necessary and wise procedure.

Question asked of Dr Newberger: How often should a health examination be done: weekly, monthly or how frequently?

Dr Newberger: Such examination should be done as pre-employment routine and should be repeated as often as necessary. An examination should be made if the employee is away from his work on account of illness. It seems to me that one physical examination a year is not asking too much. This examination should include an x-ray of the chest of all employees.

Question: I am thinking of maternity hospital personnel in Chicago. How often do they require an examination?

Dr Newberger: I do not know.

Dr Cline: I should like to speak for a moment on the use of masks. Our physicians in Bloomington do not recognize the value of masks, consequently such are not required to be worn by the nursing and medical personnel connected with the nursery. It is quite obvious that no surgeon would attempt to do major surgery without wearing a mask; the newborn infant is just as susceptible

to infection as the peritoneum. Furthermore I should like to speak on one more point. I do not see the sense of jumping all over hospital administrators and nurses when physicians have to be educated too. The medical profession is reluctant to wash their hands and may reasonably be suspected as being common carriers of many diseases from patient to patient.

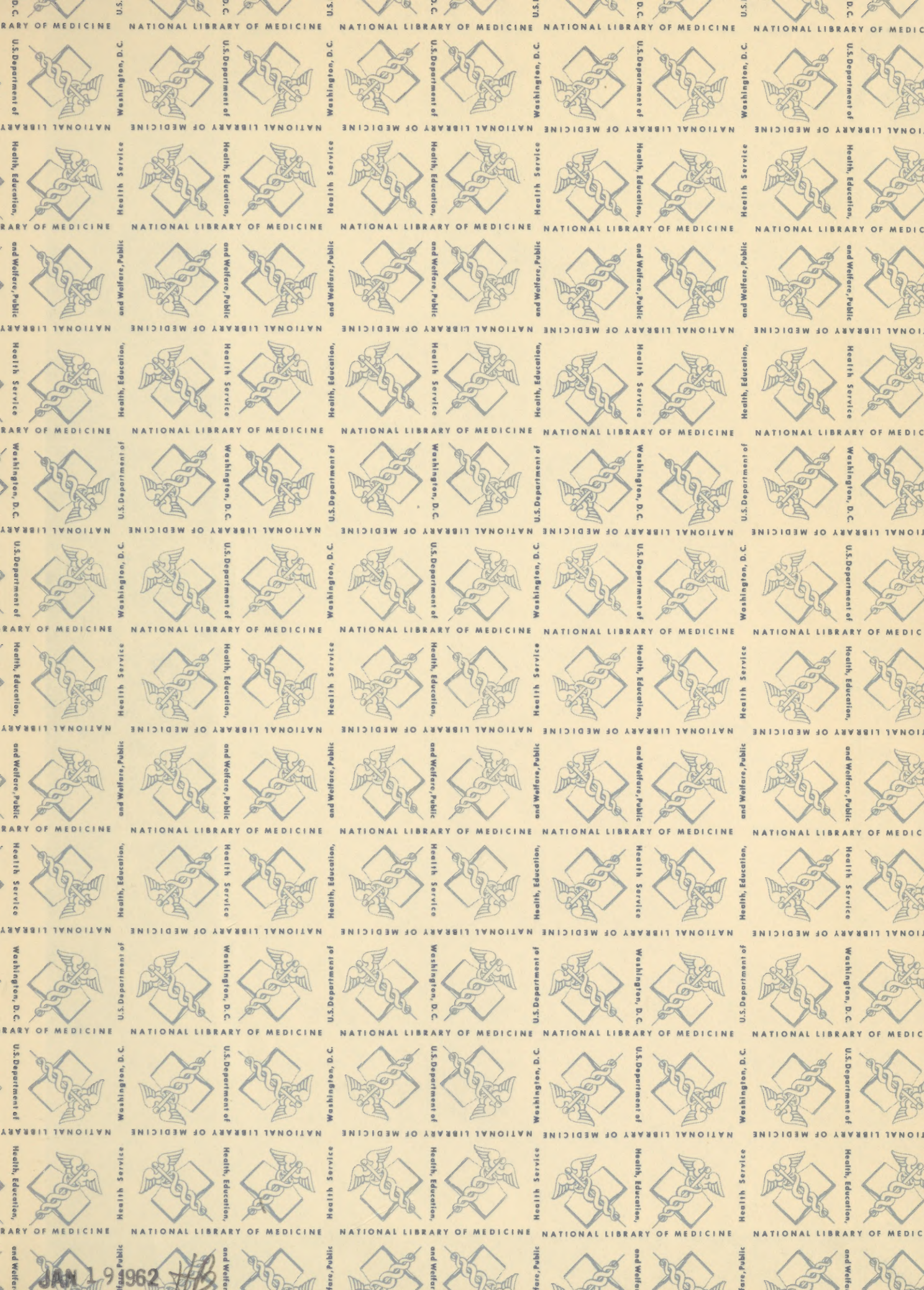
Dr. Watt: I think Dr Cline can get **some** support from me.

Dr Herbolsheimer: Sister Justine pointed out that it certainly is a big job to run a hospital. I believe that we all recognize that it is because we cannot tell what our personnel are doing when the administrator's back is turned. Recently when I was making a rapid tour in the southern part of the State, I found a nurse in a better than average hospital picking up a small premature infant out of a Gordon Armstrong incubator just after she had given care to sick children in the Pediatrics Department. In the first place the incubator was in the room with three bassinets and cribs containing sick children. Some of these children had diarrhea. Furthermore the nurse did not use gown, cap and mask technic and she did not wash her hands between handling cases. The hospital obviously knew that I was going to be there at the time of this visit and the visit was made in conjunction with the administrator of the hospital. Needless to say I was so horrified by this impossibly poor nursing technic that I could not refrain from calling the nurse's attention to what she had done even in the presence of the administrator and some guests.

Mr Vonderheit: We have heard some of the value of ultra violet light in the nursery. I would not be without it. If you can, through the use of this equipment, reduce the bacteria count in a nursery, you have gone a long way toward reducing the problem.

Mr Hendrix: I feel personally that the results of the use of the ultra violet light are questionable. I would like to stress this point. The use of germicidal lamps should not encourage the adoption of poor technics.

The meeting adjourned at five o'clock.



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